The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLIV No. 6244 — LONDON, APRIL 22, 1955 — PRICE 8d.

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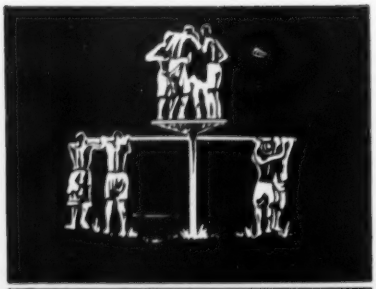

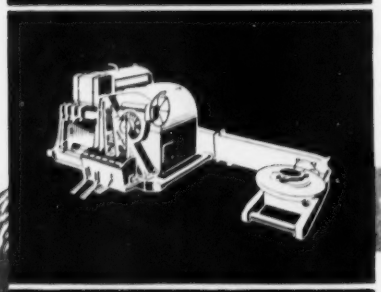

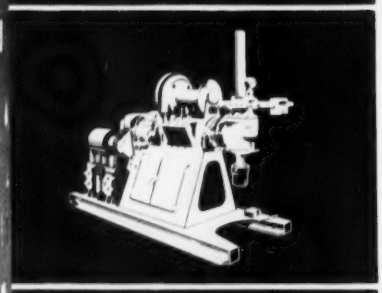

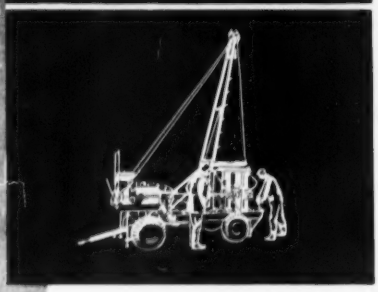

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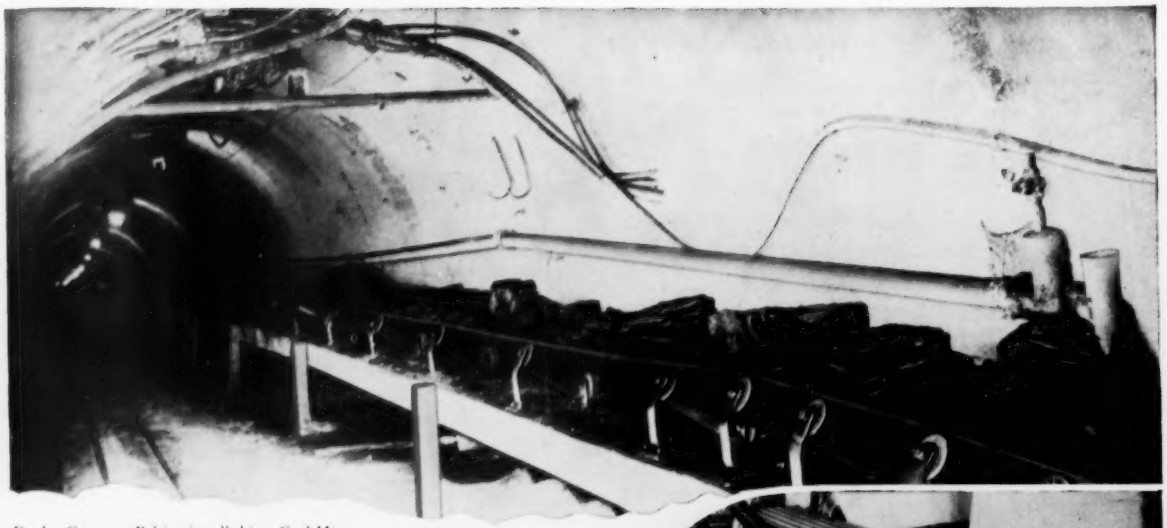

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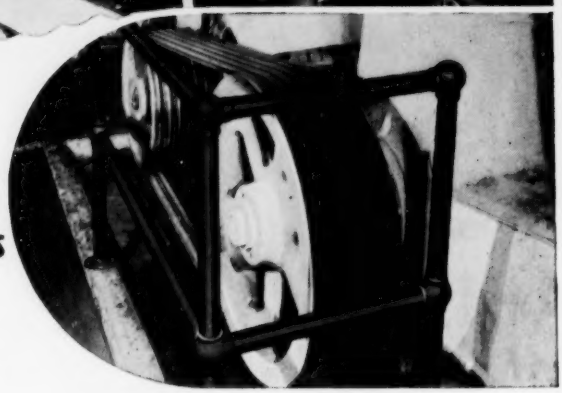
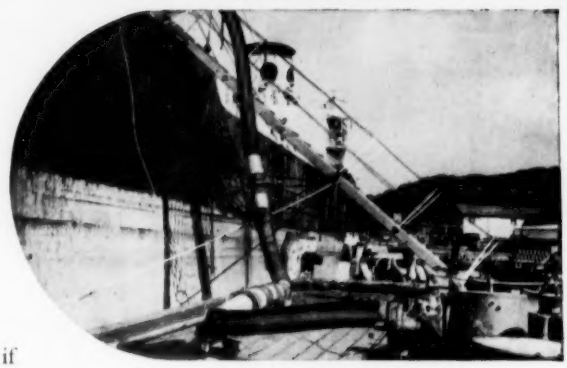


A Dunlop Compressor Drive in operation in an engine room.



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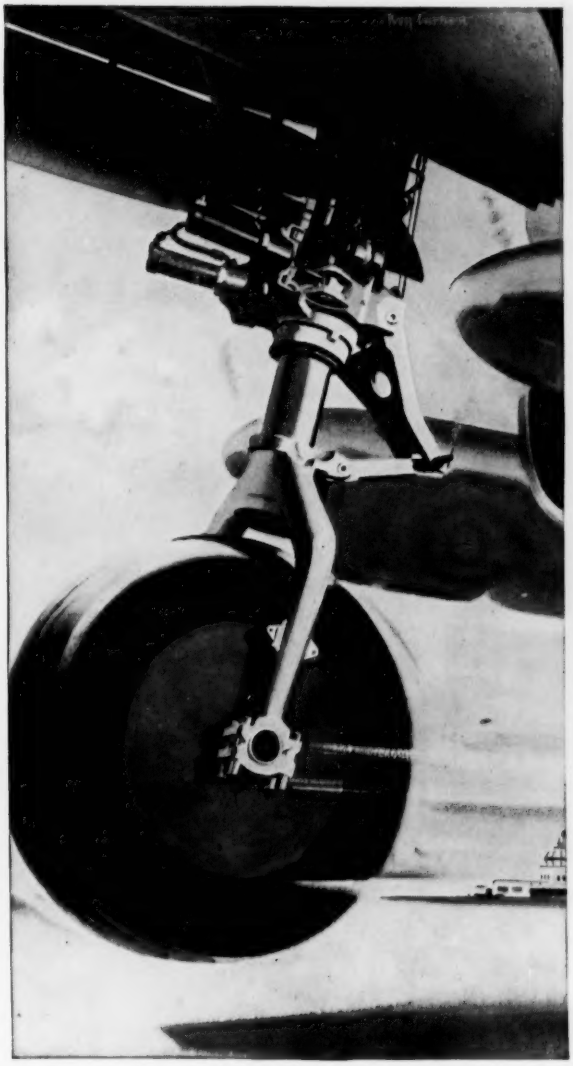

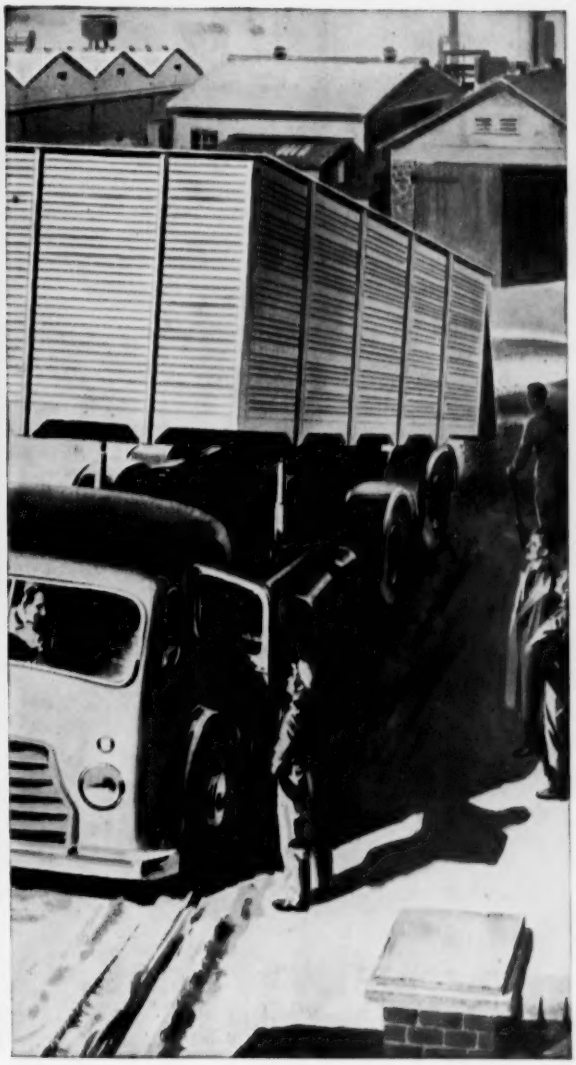

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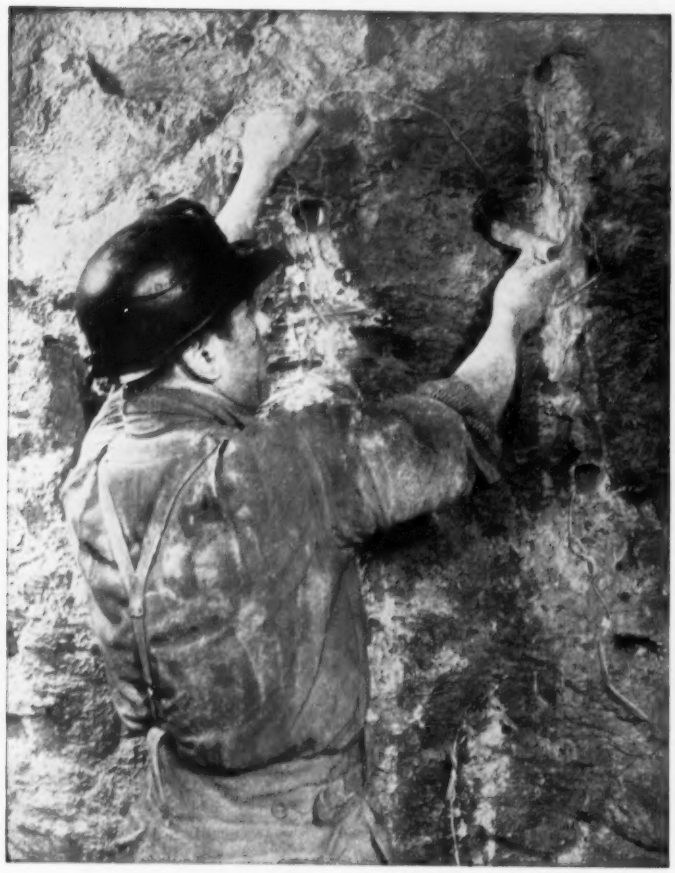

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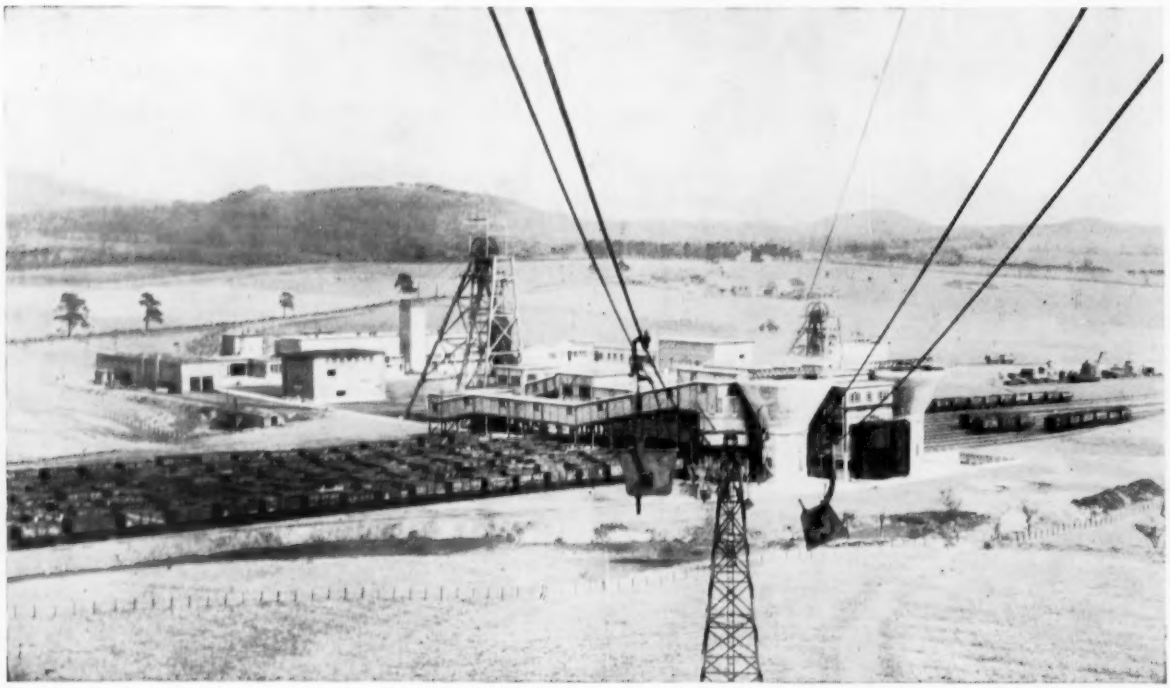

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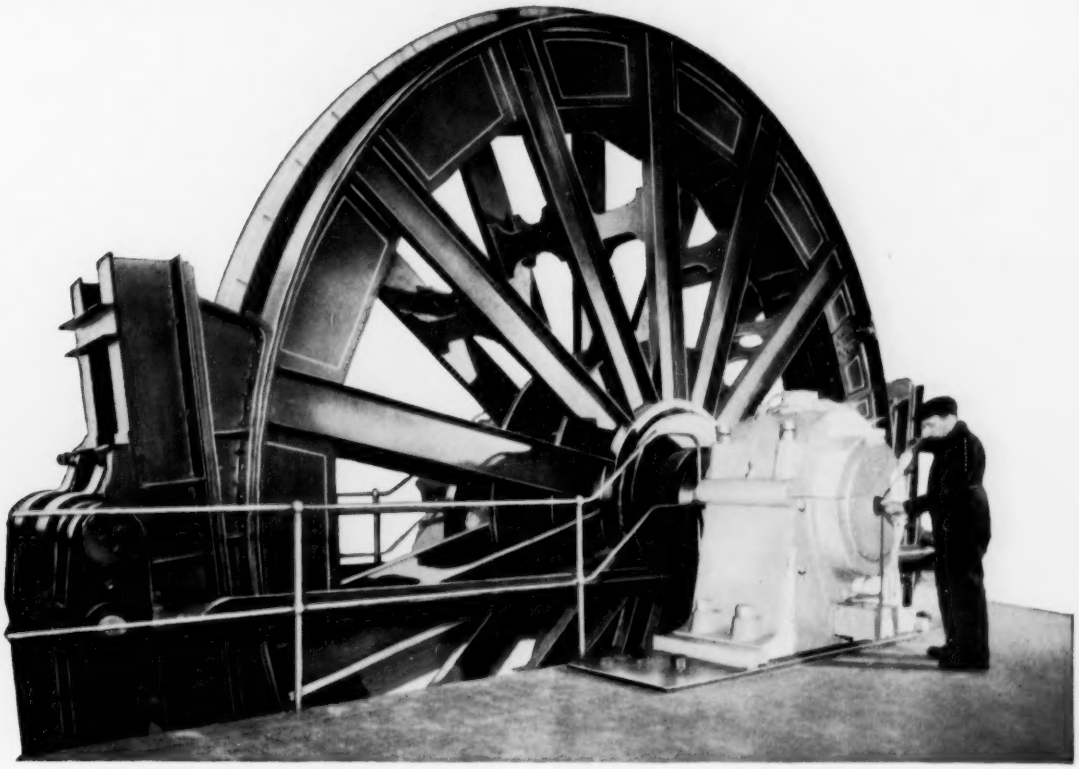

To meet the requirements of the reconstructed Bradford Colliery, Manchester, this 24 ft. diameter Koepe winder has been installed to raise 400 tons per hour in 12-ton skips from an ultimate depth of 3,850 ft.

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Established 1835

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NOTES AND COMMENTS

Mr. Butler Relies on the Bank Rate

Throughout his four Budgets, Mr. Butler has shown himself to be consistently attached to three principles. The first is a belief that taxation in the United Kingdom is dangerously onerous, that the steady and deliberate process of eroding it should not be halted except for the most compelling reasons and that tax reduction should be by simple cuts rather than by alleviation of the hard cases that high taxation causes. The second is a conception of the national economy as a living organism, so that whereas others have been concerned with its size and shape, he has been concerned with its virility; more than anything, this has earned him the reputation of a gambler. The third is a conviction that the Budget is best regarded (as it used to be) as a balance of income and expenditure, and that as the effective regulator of the economy, it is hopelessly clumsy. In applying these principles to the 1955 Budget, Mr. Butler had three problems. The first was economic; how to abide by the first two principles when the country is in balance of payments difficulties. The second was political; how to apply his principles (and particularly the first) without incurring the charge of seeking to steal votes of the electors. The third was administrative; how to frame the Finance Bill with a General Election to be held on May 26.

The answer to the last problem has been found in a simplified Finance Bill. He has faced the second problem by sweeping it aside. The Budget is not an electioneering one, though it ought to do the Tories a lot of good at the polls. The public, and the City particularly, has been surprised at what the Chancellor has felt able to give away; and, to put it at its crudest, the electorate could probably have been bought for a good deal less. The obvious note catcher, if Mr. Butler was looking for one, would have been a reduction in the tax on beer, which would not only have been popular, but would also have taken a point or two from the cost of living index and a good deal of steam from the Labour Party's election campaign.

It is the first problem that is all-important. Clearly, Mr. Butler has risked an increase in inflationary pressure. Not, indeed, as much as is in some quarters being claimed. The Socialists cannot logically claim that this is a "Class Budget" and at the same time that it will create excessive demand. The very fact that it is a "Class Budget" implies that the tax concessions are concentrated among those whose propensity to save is the greatest. Industry, too, collars more than a quarter of the income tax relief, while the surplus budgeted for, at £148,000,000, is still an enormous sum.

The real doubt must still be whether the econonomy can grow sufficiently to meet home demand and at the same time earn the necessary surplus on foreign account. But even to put the problem in this way is to justify Mr. Butler in part. How can the economy grow without encouragement and nourishment?

Finally, Mr. Butler clearly thinks that Bank rate is a more effective regulator than an annual Budget introduced, irrespective of current economic circumstances, on a Tuesday in Spring. Thus, if in fact a further rise in Bank rate is needed, it would not—to Mr. Butler—mean that he had necessarily guessed wrong in his Budget. Still less does it mean that he is cynically handing out largesse before the election only to withdraw it through Bank rate when the Tories are safely back. The Chancellor believes in Bank rate. And it is in his belief in Bank rate, if anywhere, that he shows himself to be a gambler. If Bank rate can do what Mr. Butler expects of it the Budget's inflationary danger need not be feared; but we shall not know till the end of this year whether he is right.

Copperbelt to Cease Importing U.S. Coal

The copper mines of Northern Rhodesia are to cease importing coal from the United States. The lack of rail transportation facilities which hitherto denied the Copperbelt an assured and adequate supply of Wankie coal has been largely overcome. During March the Rhodesia Railways moved 319,000 tons of coal to various destinations, a record tonnage comparing favourably with the previous record of 291,267 tons moved in November, 1954, and it is reported from the Federation that a continual supply to meet the full requirements of the mines is now more certain than at

any period in Copperbelt history. Large stockpiles are being accumulated and wood burning progressively reduced, so that the supply of coal already delivered to Copperbelt consumers is rather more than that necessary to satisfy immediate requirements.

During the recent strike a stockpile of more than 100,000 tons was built up, while in addition the Rhodesia Railways delivered 81,500 tons in January, 84,000 tons in February and nearly 90,000 tons in March. As the copper mines are still using wood fuel and are not yet quite back to normal production, excess coal arriving in Northern Rhodesia is being stockpiled—and will continue to be stockpiled—in order to minimize the effect of seasonal railway traffic on deliveries of coal to the North.

Meanwhile, coal from the United States is still arriving at Lobito following orders placed some months ago.

New Mineral Deposits in Poland

Up to 1939 geological exploration on Polish territory was mainly restricted to oil prospecting in the Carpathians, while iron ore, zinc and lead, and coal were prospected for only sporadically. As a result, only about a quarter of the whole area of the country was explored, and it was generally believed that the untapped tracts contained little of value. These facts are revealed in an article in *Pryeglad Gorniczy*.

Since the war great importance has been attached to the search for new deposits, owing to the fact that Poland has engaged in large scale plans for industrialization. Many geologists have been trained, and home production of boring machinery has been increased to such a degree that Poland no longer needs to import this equipment.

One of the most important discoveries of the past few years is that of deposits of potassium salts in Klodowa, Poznan. Exploitation of these will begin shortly, and should be of great value for agricultural purposes.

A survey begun in 1949 near Rybnik, Stalinogród, has led to the discovery of large deposits of various coking coals, and a mine is being sunk at Mszana, while others will be sunk in the near future. The entire coal basin area, in which the major part of Poland's industry is situated, is being thoroughly explored both around working mines and in hitherto untouched districts, with the result that several new shafts have been sunk, and new levels opened up in existing pits. There has also been a consequent development of opencast mining in the area.

The existence of lignite in Poland has long been known, but until recently boring had been sporadic and the extent of the deposits was unassessed, since exploitation would not have been an economic proposition at that time. Since 1945 there has been fairly extensive mining for lignite in the Western Territories, and the exploitation of deposits in other parts of the country is to begin shortly. The principal areas of interest will be in Poznan. Valuable deposits of natural gas have been found in the Carpathians and their foothills, as well as in the Stalinogród district.

For several years Poland has been producing a large proportion of the world's zinc supply, and lately new deposits have been found in the Cracow district. Copper mining, on the other hand, is a recent development, and investigations have revealed deposits important enough to warrant opening a number of mines. Prospecting for iron ore has been carried out in the Czestochowa, Kielce and Radom areas where valuable deposits have been found and new mines opened. In the Swietokrzyskie Mountains large deposits of ferriferous sand occur, which will be exploited by methods recently evolved.

The area covered by new prospecting rises steadily year by year. Taking the area surveyed as 100 for 1950, the 1953 figures for coal, non-ferrous ores, and iron ore respectively were 315, 680, and 240

Australia

(From Our Own Correspondent)

Melbourne, March 30.

An important judgment has been given in the High Court in regard to a contention by Mount Isa Mines Ltd., which claimed that money spent on the town of Mount Isa should be treated for tax purposes in the same way as money spent on mining development. The Income Tax Act allows mining companies to treat capital invested in development as a wasting asset with a life equivalent to the life of the mine. The Mount Isa mine and its dependent community is in sparsely settled pastoral country 1,450 miles north-west of Brisbane. The Court ruled that the company commenced its operations in 1924 in dry, hot, sparsely settled country, and that the only way of securing the large force of labour necessary for its operations was by providing good accommodation for the workers and by providing the amenities of a modern town. Such a town the company has built.

The Court considered that had the workers been housed in tents, there was no doubt the money so spent in that way would have been allowable as a tax deduction; also that the company could not have attracted labour to so remote and unattractive an area without building the town, and that expenditure was part of the cost of expanding and maintaining the undertaking. The Mount Isa Company had appealed against tax assessments for the years 1950 and 1951. The judgment upheld the contention on the cost of the town, but disallowed another contention that costs of prospecting and other necessary spending to start the industry were also tax deductions. The estimated cost of building the town of Mount Isa over the past 20 years has been stated at about £A2,000,000. Tax relief, following the judgment, should amount to between £A40,000 and £A50,000 a year.

POLICY OF ELECTROLYTIC ZINC

The question has arisen amongst investors as to what the Electrolytic Zinc Co. of Australasia Ltd. will do in regard to its steadily increasing profits. Net profits have exceeded £1,000,000 for each of the past six years and have twice passed £2,000,000. Last year's dividend, 47½ per cent, took £A1,425,000 of the total profit of £A2,186,840. This year's profit is likely to be still greater. Alternatives discussed by investors are: the payment of increased dividends, or the formation of a holding company, with shareholders receiving shares proportionate to the present day value of the assets. Provision of adequate electric power will permit considerable increase in the company's activities at Risdon.

The new sulphate of ammonia plant is nearly ready to commence working, only awaiting sufficient electric power from the Tasmanian Hydro-Electric Commission. The cost of the plant has been about £A3,000,000 and commensurate profits should be considerable. Zinc production at Risdon for the first 32 weeks of the financial year to February 9, 1955, was 64,228 tons, against 58,810 tons for the same period last year, therefore, the full year should see a substantial increase in zinc production over previous periods. The West Coast mines are producing increased tonnages of lead, zinc and copper concentrates. The present objective is to treat 250,000 tons of ore per year. Ore reserves approximate 2,000,000 tons, or eight years' life. The company's various financial reserves total £A12,755,000; annual provision for depreciation and amortization, before assessing profit, is £A750,000, so it is natural that there should be some speculation as to the future policy of the company.

Pyrochlore in East Africa

By JACK SPALDING,
A.R.S.M., B.Sc., M.I.M.M., M.C.M.M.S.S.A.

The Billiton Company have a controlling interest in the Mbeya Exploration Co. Ltd., a company now being formed to investigate and exploit the Mbeya pyrochlore deposit. Associated with the Billiton Company is the Colonial Development Corporation which hold the rights over nearby coalfields. The deposit is situated about 25 miles from Mbeya.

The deposit was discovered by the Tanganyika Geological Survey. Realizing the strategic importance of the metal niobium and the possibility of its occurrence in association with carbonatites (volcanic limestones), search was made of the aerial photographs of the Territory for ring structures. Many of these were noted, and this research was followed by aerial and ground prospecting, as a result of which a number of carbonatite occurrences were located. Amongst the deposits found, that on Panda Hill was conspicuous in that large crystals of pyrochlore were clearly visible in the carbonatite. To avoid confusion with the Mpanda Mine the occurrence has now been named the Mbeya Pyrochlore Deposit.

The Geological Survey followed this up with an intensive drilling and sampling campaign, as a result of which nearly 10,000,000 tons of ore were indicated, of a value of 0.3 per cent niobium oxide. This large tonnage represents only a small part of the deposit, and there are signs that it is not even the richest part. The values appeared to be very uniformly distributed, although the carbonatite rocks are themselves extremely heterogeneous.

Preparations for the start of the exploration are already under way, and by August it is hoped to have a research plant on the site. The first stage of the investigation will consist in checking the findings of the Geological Department. Although the deposit is 300 miles from the nearest point on the railway, it is excellently situated in all other respects.

If this deposit is exploited it will necessarily be on a very large scale, and for this much power will be required. Within a few months it is proposed, therefore, to start the exploration of the Kiwira-Songwe coalfield. Though some 55 miles from the deposit and considerably more distant than the Galula coalfield, this field is the more interesting as it lies within 20 miles of Lake Nyasa, and is, therefore, a potential source of coal for Nyasaland.

A FURTHER DEPOSIT

Another large deposit has been found near the coast in Kenya almost on the Tanganyika border. It contains thorium as well as pyrochlore, and appears to be as extensive and considerably richer than the Mbeya Pyrochlore deposit, the grade of 30,000,000 tons indicated being 0.7 per cent niobium plus other rare earths. It seems, however, that the very fine grain of the mineral compared to that at Mbeya will render its extraction much more difficult and expensive. The Government of Kenya are now inviting applications from responsible mining firms for the exploration and exploitation of this deposit.

Much research has recently been carried out by the Montsanto Company on the extraction and marketing of the phosphate and pyrochlore content of the soil derived from another carbonatite at Sukulu in Uganda. There seems to be some doubt, however, as to whether this proposition will come to fruition.

Low-grade Taconite in Usable Concentrates

The successful operation of a laboratory-scale pilot plant for processing low-grade Michigan taconite iron ore into usable concentrates, a development which would make available a large new reserve of iron ore for the steel industry, has been announced by the Jones and Laughlin Steel Corporation, the fourth largest steel producer in the United States.

The pilot plant, located at the company's Ore Research Laboratory at Negaunee, United States, is said to be the first such plant to demonstrate that Michigan non-magnetic ores can be rendered magnetic and then concentrated by simple magnetic separation. It is believed also that other American steel companies are similarly well advanced in developing methods for processing the low-grade iron ore available in the Mesabi Range. The new continuous process pilot plant at Negaunee is designed to up-grade non-magnetic ores to a usable concentrate containing as much as 63 per cent iron. Slightly more than two tons of Michigan crude taconite are needed to produce one ton of ore concentrate.

NEW TYPE OF REACTOR

The solution of the problem of magnetic conversion is provided by a new type of fluidized solids reactor which is in commercial use, principally for roasting sulphide ores. A small-scale model of this reactor is used in the Negaunee laboratory pilot plant. Operation is on the same principle as the catalytic cracking reactors employed in petroleum refining. Non-magnetic Michigan taconite, ground to minus-14 mesh particle size, is chemically reduced to magnetite while suspended in a turbulent stream of hot reducing gas. Accurate temperature control and uniformity of reaction is maintained by the intimate contact of gas with the taconite particles in turbulent motion.

After leaving the furnace, the hot ore is quenched in water. This shock-cooling produces cracks in the ore which facilitate fine-grinding and better separation of iron mineral from the silica after grinding. Following three successive stages of grinding and magnetic separation, the ore is concentrated to a high-grade fraction containing as much as 63 per cent iron. About half of the original ore is eliminated as a high silica waste product.

In the first concentration step, the minus 14 mesh ore enters a magnetic separator where about 20 per cent of the material is discarded as tailings. In the second step, the rough concentrate from the previous operation is ground to minus 100 mesh and then subjected to a second magnetic separation process. Here another 20 per cent of the original crude ore is rejected as tailings. Finally in the third operation, the concentrate remaining, which amounts to 60 per cent by weight of the feed to the plant, is further ground to minus 325 mesh and again treated magnetically to eliminate further the non-magnetic waste material.

The wet grinding operations are performed in two successive ball mills. Each mill operates in conjunction with a classifier. After completion of the concentration steps the water is removed by thickening tanks and by drum filters which extract water by means of vacuum pumps. The final concentrate obtained after three stages of grinding and magnetic separation is too fine to be used in blast furnaces or to be sintered directly by the conventional means. To prepare a suitably coarse feed for sintering, pelletizing is resorted to as the initial agglomerating process.

Developments with Rotary Kilns

By C. C. DOWNIE

Rotary kilns for roasting operations have been used only spasmodically in metallurgical practice despite the fact that they have been widely developed in associated activities connected with the chemical industries. The following article describes the developments achieved with rotary kilns in the field of ore treatment.

A number of rotary drying kilns require exacting vacuum conditions to ensure the most rapid removal of moisture which is superfluous for roasting conditions, but otherwise, in many cases, the same type of construction suffices. In other respects also the equipment is more or less on similar lines, and even the drying temperatures correspond to those necessary in roasting ores, mattes, and residues. Thus in the drying of coal for briquetting purposes, it has been found convenient to use a temperature ranging from 700 deg. to 750 deg. C. while where the moisture content has to be reduced from 22 per cent down to 4 per cent, the intensive drying required necessitates from 850 deg. to 900 deg. C.

Except for the difference in vacuum conditions, the same temperature and pressure gauges for reading off, or recording the initial and leaving figures of the flue gases, are the same. The fact that some 7,500,000 thermal units are required per hour (German rating) will give some indication of the size of these units. The various feeding devices, conveyors, distributing and discharging sections, correspond to large rotary roasters, but the cyclone collectors and explosion exhaust pipes for dealing with the gases expelled, belong to a different category.[1] (In the drying of garnierites for briquetting purposes, single-deck calcining hearths with mechanical rakes suffice, and also special designs of roasters for handling the refined matte from the converters, i.e., in preference to the rotary kiln designs.) The amount of moisture removed per pound of coal consumed shows varying figures, depending on the class of ore dealt with. Thus at one cyanide mill, one pound of coal removed 9 lb. of water, at a copper works 6.3 lb. of water, and with a clayey ore only 4.5 lb. of water, using the same class of rotary dryer.

CALCINING DOLOMITE, CHROME ORES AND BARYTES

Conditions differ somewhat where considerably higher temperatures are necessary in the rotary kiln as required for the burning of dolomite and magnesite, more corresponding to that employed in handling cement clinker. These kilns are upwards of 200 ft. in length, and make about a half revolution per minute. The drum has a diameter of 9 ft., and the drive is by means of an open toothed rim, driven by a pinion carried by plummer blocks fastened on the drum. Transmission of the pinion shaft from the motor speed of 725 r.p.m. to 2.3 r.p.m. is subdivided into four steps.

The diameter of the wheel of the last step is limited by the diameter of the rotary kiln, but in spite of the comparatively low gear output of 76 h.p. the last steps of the gear already give rise to appreciable torques. These in themselves justify the gear being constructed in robust manner, and as it has to be installed under the tube of the rotary kiln, easy erection and good access to all parts is a feature. For this reason, the top part of the casing is split vertically over the bearings, so that it can be dismounted sideways, while the caps of the bearings are designed for instant inspection.

In this gear, which is equipped with babbited bearings, lubrication is by oil-feed under pressure, using two independent gear type oil pumps. One of these is driven direct by the fast-running gear shaft, and the other by a special small motor, while a plate sieve filter and cooler keep the oil clean and cool. These features are important in view of the great heat radiating from rotary kilns, and also in view of the almost unavoidable presence of dust. The state of the bearings can be ascertained at all times as oil circulation indicators and thermometers are included in the equipment. Inspection holes equipped with caps are provided for inspecting the teeth themselves.

An electric motor of 20 h.p. with a speed of 960 r.p.m. effects the drive through the gear, and with the final speed of 6.6 r.p.m. this passes on to the pinion and toothed rim of the drum. For the purpose of keeping the motor as far away as possible from the zone of radiation of the connected cooling drum, it is placed at right angles in front of the gear. As a consequence, the first step of this requires to have a bevel-wheel transmission.[2] This work of burning dolomite in some respects corresponds to the calcining of chromium ores. Formerly, chrome ores hailing from Russia and Turkey were initially calcined with lime, but better results were obtained by substituting dolomite.

SPECIALIZED TREATMENTS

The rotary kiln used here is on the same lines as is used for burning dolomite, but the gearing has to be such that it revolves at a materially slower speed, approximating to one revolution in from 3 to 5 minutes, while a much shorter length suffices. The drums used are 40 ft. in length and 8 ft. in diameter, and firing is done by means of pulverized coal. Unlike the burning of dolomite, however, the chrome charge has to be directly subjected to lixiviation for extraction of the soluble chromium salts, and hence is intermediately transferred to a cooling drum adjoining the main kiln drum. In order to save floor space, this is done conveniently by connecting the discharge-end to the cooling drum through a hopper, and which latter drum functions in parallel direction under the main drum.

The calcining treatment of chrome ores does not appear to justify any speeding-up, as is possible in some other rotary kiln processes.[3] A different state of affairs exists in the roasting of barytes for the production of lithopone, which is to-day carried out on an extensive scale in the U.S.A. One of the giant rotary kilns fired by pulverized coal is 9 ft. in diameter, and nearly 300 ft. in length—probably one of the world's largest furnaces. The barytes and coke are fed in at one end, through the agency of worm, bucket-elevator, and feeding hopper, initially fed from a moving belt, and slowly passed through the entire length, non-stop, to emerge in the form of barium sulphide. The presence of particles of ash, or more rarely undecomposed carbon, is of no account, since when ultimately digested in water, the supernatant liquor is practically pure barium sulphide solution, which in turn is treated with zinc sulphate to provide lithopone. The temperatures range from 550 deg. to upwards of 900 deg. C. and the speed of output is largely dependent upon the great length of the kiln, as only a relatively thin stream of material is passing through continuously.[4]

A convenient medium for initially testing the roasting

capacity of rotary furnaces has frequently been taken advantage of by using a more or less "home-made" drum, fired by a gas burner of known design, with provisions for altering the speed of revolution, and also the longitudinal slope, to handle about 1 ton per 24 hours. This is equipped with temperature recording instruments, and other auxiliaries, and has also been used with steam connections for the purpose of trying out the more complex forms of steam roasting, such as is necessary in the case of handling tin and antimony sulphide materials.

Gas is used as the firing medium for convenience with small-scale work, and with a burner of recognized size and output, the number of B.Th.U. per pound of material dealt with, is then calculated to pounds of coal required. It was found, however, that the heat losses differed somewhat markedly from that obtained with the large rotary hearths, despite the care that was taken, but nevertheless gave a good general criterion of results to be anticipated.[5]

DEVELOPMENT AND USE OF ROTARY KILNS

Further developments of this type of experimental equipment are seen in a miniature rotary kiln originally introduced to a sugar refinery, but which has since been utilized for making test runs on pyrites, blende, and manganese ores. Briefly, the rotary drum, fire-box, feeding hopper, and exhaust fan connections, are all separate units, which can be assembled at any required location where a source of power is available. The rotary drum has a single gear-wheel connection situated at its centre, while further supported by three sets of rollers, and the fire-box unit, whether for oil or pulverized coal, is mounted on wheels to facilitate easy transport.[6]

Reference has already been made to the large inclined rotary kilns engaged for extracting metals from dump rubble, ashes, and residues from brass foundries, and metal refineries, besides poor zinc and lead ores. The main feature is the volatilization and recovery of zinc, to a lesser extent lead, while antimony and tin are reclaimed, and small copper contents are obtained as a poor matte. Annual production, using temperatures ranging from 930 deg. to 1,200 deg. C. is claimed to reach from 100,000 to 120,000 tons of zinc oxide, and 15,000 to 20,000 tons of lead oxide, from material which had formerly adorned waste dumps.[7] In principle, the rotary kiln should be of large size, partly for the purpose of exposing a greater surface of ore to the gas, thus permitting slower speed, and partly to reduce the velocity of the gas passing through the cylinder.

Faster driving and harder firing, i.e., increasing the velocity of the combustion gases through the kiln, increases dust production, and amplifies the work of the dust extraction plant. Rotary kilns have only been used to a limited extent for certain blendes, but are still used for poor lead sulphide ores, where the Bruckner design using cylinders 20 ft. in length by 7 ft. in diameter, which handle 8 tons per day at a consumption of about 1 ton of coal, reduce the sulphur contents from over 20 per cent down to 3 per cent. This intermittent type of rotary hearth permits better control than alternative continuously working roasters, and although more wasteful of fuel, is still preferred in Italy, as a visit to the Spezia works revealed, despite the shortage of fuel in that country.[8]

BRUCKNER FURNACES

Many of the other Bruckner furnaces have been replaced for reducing sulphide copper ores. It has been claimed that these and other revolving hearths are better suited for chloridizing roasting than oxidizing roasting, but they have a long way to go to attain the accuracy of well-controlled manually-operated stationary hearths, or the multi-deck roaster. This relates to the ultimate recovery of the small gold contents, which, because of the greater individual attention, are best dealt with in the hand-furnaces, next best in the multi-deck furnaces, and least of all in the rotary roaster. (Regarding ultimate wet copper extraction, roasting in the multi-deck hearth allows scope for handling at different temperatures, at different stages, avoidance of temperatures above 600 deg. C. which unduly volatilize cupric chloride, or conditions which form the more insoluble oxide, and cuprous chloride.)

IMPROVED EQUIPMENT

Ramifications of the original Bruckner design are seen in the White-Howell rotary hearth for the chloridizing roasting of silver ores, which is wide at the fire-end, and has projecting ribs for stirring up the mass, and the Hofman revolving furnace, which has a fireplace and flue at each end to permit reversing the direction of the hot gases. Fuel consumption is claimed to be reduced to within 5 per cent of the weight of ore, whereas with former designs this required 8 per cent.[9]

A post-war development of these rotary hearths is seen in improved screw feeders, and gear variable speed changers, which permit regulating by the simple turning of a hand-wheel, besides specialized exhaust systems.[10] Reference has not been made to the "Concentra" oil-fired rotary kilns, or the pulverized coal-fired rotary kilns by Andreas, Munster, which are upwards of 200 ft. in length (both of which designs have been taken over by Krupps), as these appear to be more or less solely devoted to the cement industry. Mention has not been made of designs which are specially constructed to tackle the roasting or calcining of materials which are difficult to handle for various reasons, and which belong to a separate category.

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2. Fellner & Ziegler, Frankfort.
3. Demag, Duisburg.
4. Sherwin Williams, Chicago, U.S.A.
5. Gustav Barthel, Dresden.
6. Bruhl Sugar Refinery, Bruhl, Cologne.
7. Krupp Grusonwerke, Magdeburg-Backau.
8 and 9. Different designs taken over by General Electric Company, Schenectady, N.Y., U.S.A.
10. Link-Belt Company, Chicago, U.S.A.

Nepheline Syenite Plant for Canada

The construction of a new nepheline syenite plant has been started by the International Minerals and Chemical Corporation, United States, at Blue Mountains, near Havelock, Ontario. The plant will cost $1,500,000 and will be completed late in 1955.

Chicago Chemical Co. controls a deposit of about 30,000,000 tons of superior quality nepheline syenite at that site. The deposit comprises a high alumina, high alkali mineral which is an important raw material for the glass and ceramic industries in the United States and Canada. It is claimed that the plant will be the most modern and efficient in the industry.

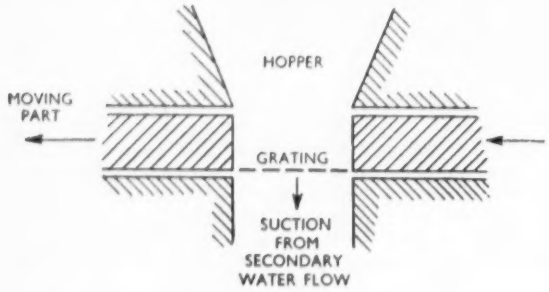
The new facility will be operated by Consolidated Feldspar Department of Industrial Minerals Division of International, the world's largest producer of feldspar and feldspathic materials, operating ten mines and mills in the United States and Canada. The new Ontario mill is a further step in the planned expansion of the department.

HYDRAULIC TRANSPORT—II

Methods of Pumping Solids

The following article is condensed from a paper entitled *The Hydraulic Transport of Solid Material in Pipes*, by R. C. Worster, B.Sc.(Eng.), and D. F. Denny, B.Sc.(Eng.), Ph.D., which was presented at a general meeting of The Institution of Mechanical Engineers in London on March 25, 1955. The authors are respectively graduate and associate members of the Institution, and the first portion of the article appearing in our issue of April 15, 1955, discussed the flow of material through various inclinations of pipes while the second instalment appearing herewith describes methods of pumping solids and the types of feeder machines employed. A third and final instalment will deal with the depreciation of transported material and operating plant.

The simplest method of pumping solids is to mix them with the desired amount of water in a tank and then pass them through a centrifugal pump the passages of which are wide enough to take the largest particles. If a pump speed and solids feed rate are constant there is no difficulty in maintaining a uniform flow in the pipe.



Moving-Pocket Feeder

This method is widely used for conveying fine material, and one notable scheme is that at Carling, where five centrifugal pumps in series convey colliery tailings to a power station over a distance of 5½ miles. It is usual with solids pumps to pressure-grease the internal bearings and to flush the glands continuously with clean water, but the real problem is the erosion of the volute and impeller and it is this factor which restricts their use.

HIGH-PRESSURE SYSTEMS

Long-distance horizontal transport of vertical lifts from deep mines necessitate a very high pressure at the entry to the pipe system, or boosters along its length. This can be achieved by any of the following methods:

(a) The use of several centrifugal pumps in series.

(b) The solids and water may be passed together through a positive-displacement pump. The problem of valves for such a pump is a serious one. So far as is known this method has not been used for solids larger than ¼ in.

(c) The solids may be fed mechanically into the pipeline after the water has been raised to the necessary pressure. Design of suitable centrifugal pumps for this duty may be difficult and, in many instances, the size and cost of cleaning plant for this purpose would be prohibitive. A positive-displacement pump may often be a better solution.

Hydraulic transport systems may be divided into two categories, closed cycle and open cycle, according to whether the liquid conveying the solids is recirculated and used again or not.

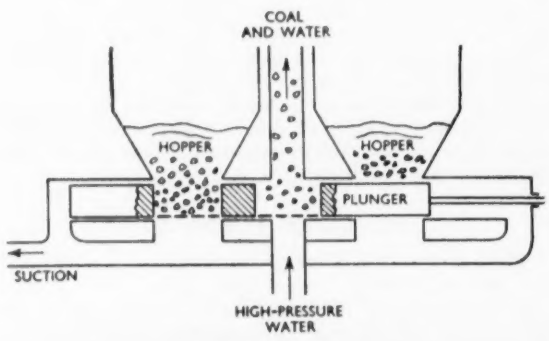
Open cycles are applicable only where there is ample supply of liquid near the inlet end of the pipeline, and means of disposing of the liquid at the discharge end of the pipe. The conveying liquid will be contaminated by fine particles and, in an open-cycle system, it may be difficult to dispose of, or uneconomic to clean. A typical application of the open cycle is the lifting of coal from a mine where water is available at the pit bottom.

In the closed cycle the water used to convey the solids is returned, after separation at the discharge end, and used again. In this way, both the provision of a continuous supply of water and its subsequent disposal after contamination are avoided. However, the fines that would otherwise accumulate in the system must be withdrawn at a rate sufficient to keep their concentration at an acceptable level. A closed cycle would be essential for lifting coal or other mineral from a dry mine, and for systems using liquid media other than water.

SOLIDS-FEEDING MACHINES

Feeders may be divided into two categories, those in which the only moving parts of the machine are valves, and those in which the moving parts themselves convey the solids from a region of low pressure (hopper) to a region of high pressure (delivery line). In practice, however, the problems of both types are almost identical. Except for the lock-hopper feeder, machines for feeding solids other than coal into high-pressure pipelines have not been developed.

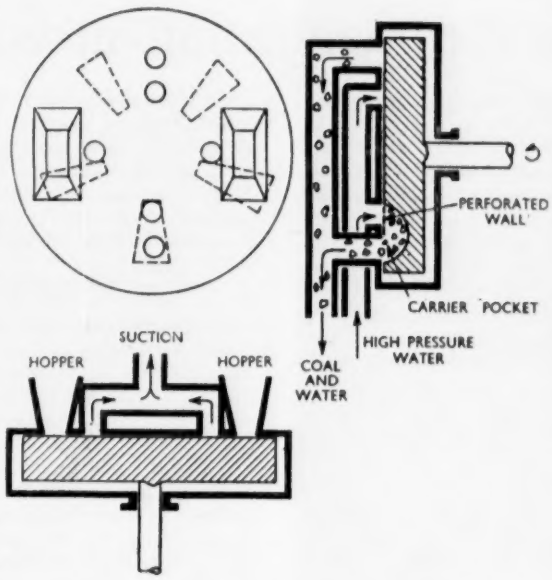
One design of the first type, a lock-hopper feeder made for the Ministry of Fuel and Power, consists of two pressure vessels each communicating alternately with a hopper and a discharge vessel. As an indication of size the outer vessel is 8 ft. in dia., and 15 ft. high; the main valves are elliptical and measure 24 in. by 18 in. The throughput of the machine will be determined not so much by the time cycle of events as by the rate at which coal can fall through the valves against the upflowing displaced water. With 3 in. coal the particle velocity through the valves is unlikely to exceed 1 ft. per sec., which corresponds to a throughput of about 100 tons per hr. The main point in favour of the lock-hopper feeder is that the leakage from the pipe to the hopper can be very small.



Reciprocating Feeder

The feature common to feeders of the moving-pocket type is that solids from the hopper are induced to fill a pocket within the moving part of the machine, and this pocket then travels to a position where water at high pressure drives the solids into the delivery pipe. The throughput of such a machine is proportional to the linear speed of the pocket, and to its volume, provided that it completely fills and empties.

If the particles are merely allowed to fill the pockets by gravity the speed and hence the throughput of the machine is seriously restricted by the slow rate of filling and, in practice, some inducement for the particles to move quickly is essential. This can be achieved by circulating the solids and water through the pocket, in one side and out the other, but this involves a solids-handling pump and unnecessary degradation of the particles.



The Disk Feeder

In the double-acting reciprocating feeder a plunger containing two rectangular pockets is reciprocated so that at each end of the stroke one pocket lies beneath a hopper and is filled with coal, whilst the other pocket falls opposite the pipeline into which its load of coal is discharged.

The delivery from a single machine of this design is interrupted for a short time during each stroke because of the lap necessary to restrict axial leakage from the pressure pipe to the hopper. This interruption can be avoided either by allowing a continuous bypass of water round the feeder, which lowers the delivered concentration, or by intermittent bypass of water through radial holes in the plunger.

DATA OF FEEDER PERFORMANCE

From a design standpoint, continuous motion is advantageous because the drive is so much simpler and the inertia of the moving parts less than with the corresponding reciprocating machine. To minimize inertia is important in regard to jamming of the machine by metal objects that may fall in the hopper. On the other hand, from a hydraulic point of view, the pockets have less chance to fill and empty when moving continuously than when reversing at each end of a reciprocating stroke. The choice of arrangement of rotary feeders is wide, though in practice many designs cannot be considered for high-pressure applications on account of their inherently high leakage.

One form of rotary feeder, in which all the pipe and hopper apertures lie in one end face is the disk feeder. With duplicate hopper and discharge pipes, the machine is symmetrical about a diameter, and with five or more pockets in the rotor the discharge is completely uniform. A small Perspex model has been tested and has given promising results.

Some performance data are available for the reciprocating-plunger type and the rotating-disk type, though no feeder has yet been in sustained operation under full working conditions.

The first feeder built by B.H.R.A. was a small machine. The plunger was 2 in. in dia. and 18 in. long, containing two pockets each of 8 cu. in. in capacity; the stroke was 7½ in., and the overall length of the machine 32 in. excluding the drive. The pipe circuit was arranged so that the feeder could deliver coal into a 1½ in. pipe at pressures up to 400 lb. per sq. in. (1,000 ft. of head). Leakage was restricted by a close clearance between the plunger and the body. Later a Perspex model of this feeder and also a model of a disk-type feeder, each supplying ¾ in. pipes, were constructed so that the flow of coal into and out of the pockets could be studied.

As originally designed there was no provision in this feeder for secondary flow to assist the coal into the pockets, and the coal delivery was less than one-quarter of the theoretical quantity based on complete filling and emptying of the pockets. When the feeder was tested under a pressure of 150 lb. per sq. in., these deliveries were halved by the leakage flow into the hopper. However, when the secondary suction flow was introduced the coal delivery could be increased almost to the theoretical quantity, and was then unaffected by leakage flow.

LEAKAGE TESTS ON RECIPROCATING FEEDERS

There are some results of leakage tests on reciprocating feeders but no comparative results for other designs.

When new, the radial clearance between the mild-steel plunger and cast-iron body of the 1½ in. feeder (the size refers to the diameter of the delivery pipe) was 0.0015 in., and the shortest leakage path 1 in. long. Leakage was proportional to pressure and amounted to 5 gal. per min. at 400 lb. per sq. in. (920 ft. of head), equivalent to about 20 per cent of the main flow for a pipe velocity of 6 ft. per sec.

After 40,000 strokes (12 hours) passing ¼ in. anthracite, leakage was only very slightly increased. The machine was then run for a further 12 hours on a coal-sand mixture designed to accelerate wear; during this test, leakage increased to treble the original amount and severe local wear occurred, though most of the sliding surface was undamaged.

After the worn plunger had been replaced by a new one made of brass, the feeder ran for about 500 hours on anthracite with no noticeable increase in leakage or wear.

POWER REQUIREMENTS

Power requirements are small and a good margin must be allowed to overcome temporary overloads, such as accompany the feed of a high proportion of very fine coal.

Where secondary flow is used to suck the coal from the hopper, power is required to drive the pump; this will be directly proportional to the theoretical coal throughput and of the order of 0.02 water h.p. per ton per hr.

Colliery Reorganization in Scotland

A Parliamentary White Paper, just out, giving an economic survey of industry and employment in Scotland, states that further progress was made during 1954 with the exceptionally heavy programme of new sinkings and colliery reorganizations on which the Scottish Division of the National Coal Board is at present engaged, and over £8,000,000 were spent on capital account compared with about £7,000,000 in 1953. To assist the development of the programme, which is designed to increase coal output to 30,000,000 tons a year by 1965, the technical staff of the Division was strengthened during the year by more appointments in the specialist fields of planning, engineering and architecture.

Eight National Coal Board collieries, which in 1953 produced 276,785 tons of coal, ceased production in 1954, making a total of 63 collieries closed since nationalization. The replacement of coal output lost by closures and by the gradual exhaustion of many old collieries, and the transfer of miners to expanding coalfields where face-room must be provided for them, are major problems which will continue for some years.

Increased coal cleaning facilities were provided during the year by the completion of the 500 ton per hour capacity coal preparation plant at Kingshill No. 1 in August, and two additional screening and hand cleaning plants, and by modifications of existing plant at other collieries. Orders were also placed for new coal preparation plants for Polkemmet, Rothes and Bedlay collieries.

REDUCED PRODUCTION

The following table compares the total output of saleable coal (in millions of tons) from National Coal Board and Licensed Mines and from Opencast Sites in 1953 and 1954.

Saleable Output	*1953*	*1954*
Deep-mined	22.823	22.577
Opencast	0.518	0.433
Total	23.341	23.010

The main causes of the fall in deep-mined output were the increased loss from disputes and the working of thinner, dirtier and more faulted seams at many collieries. Output per manshift worked at the face was 51.35 cwt. in 1954 and output per manshift of all workers was 21.22 cwt. As certain changes were made on January 1, 1954, in the classification of manpower, an accurate comparison with the previous year is difficult but, allowing roughly for these changes, face output per manshift in 1954 showed a small increase on 1953 and output per manshift of all workers showed a decline of about 0.23 cwt.

The total output of opencast coal was again lower than in previous years because of delays in bringing new sites into contract and the exceptional rainfall. The rate of output increased considerably in the second half of the year and prospects for next year are more favourable. Considering the weather conditions, good progress was made with restoration of worked-out sites to agriculture.

Satisfactory progress was made on the new sinkings at Kinneil, Bilston Glen, Bowhill No. 3, Killoch, Monktonhall, Seafield, and Valleyfield No. 3 but at Rothes and Glenochil work was retarded by the presence of water. The shafts at Barony No. 3 and Littlemill were completed and underground development continued. A new sinking near Dalkeith was approved and preliminary plans are in hand for another near Airth in the Alloa Area. Major reconstruction schemes were started at Manor Powis Colliery and at Polmaise Collieries in the Alloa Area, and work commenced on the reorganization of Douglas Colliery in the East Ayr Area, three smaller reorganizations in other Areas and three new surface drift mines. Deep boring continued in nearly all Areas and preliminary plans were made for off-shore boring in the Firth of Forth.

MECHANIZATION TESTS

Continuing their experiments with new methods to increase productivity by mechanization, the Board installed coal ploughs at Easthouses, Cardowan and Frances Collieries. The coal plough, introduced from Germany, is still to some extent experimental in this country where most seams are harder than on the Continent. The installation at Frances Colliery, incorporating a high-speed Lobbe-Hobel plough, was of particular interest because of the hardness of the coal and the gradient of the face (1 in 2½) on which the machine was working. Another machine, the Huwood Slicer, designed for work in coals too hard for ordinary ploughs, was installed in a Fife colliery.

The application of these methods calls for a new mining technique. In contrast to conventional mining, where the conveyor is on a separate track, space must be provided between the nearest row of props and the coal face to enable the loading machines and conveyors to be moved forward mechanically and without interruption. This calls for special supports, positioned according to an approved system, and trials are proceeding to ascertain the most suitable type.

The use of standard coal cutters adapted for loading as well as cutting has been extended. Loading is done by means of flights attached to the chain pick boxes. This system is easy to introduce as it is applied to conventional mining systems and involves the use of equipment to which the workmen are already accustomed. Experiments with the Marietta Miner which was being modified for possible use in driving roadways through stone, showed that the present design, even with modification, was not capable of cutting harder rocks such as sandstone, etc. The machine will, therefore, be utilized for work in coal and softer rocks.

The new cable belt conveyor mentioned in last year's report worked satisfactorily throughout the year. Successful trials were made with a new design of belt incorporating a moulded rubber shoe, thus dispensing with the use of metal shoes and giving a better grip. The use of fire-resistant belting has been gradually extended and by the end of the year the bulk of the belting being acquired was of this type.

LABOUR PROBLEMS IN THE COALFIELDS

Changes in classification for statistical purposes make an accurate comparison with previous years difficult. On the new basis total manpower increased slightly from 83,269 on January 2, 1954, to 83,352 on January 1, 1955. During the same period manpower at the coal face fell from 36,513 to 35,947. The Board's transfer scheme, to assist volunteers to move to the Fife, Lothians and Ayrshire Areas, continued to operate although employment within their own Areas was found for most of the men.

Absence percentage was 9.98 per cent compared with 9.84 per cent in 1953. 425,600 tons of coal were lost by disputes involving loss of shifts, compared with 371,900 tons in 1953.

MACHINERY AND EQUIPMENT

Aluminium Transformer to Serve Kitimat Expansion

What is stated to be the world's largest aluminium-wound power transformer is now under construction in the St. Catharine's, Ontario, plant of the English Electric Company. It will play an important part in the expansion now under way of the Kitimat, British Columbia, smelter of the Aluminium Company of Canada. The current expansion programme started in October, 1954, will add 60,000 tons to Kitimat's present aluminium production capacity of 91,500 tons a year by the end of 1956. A further expansion now authorized for completion in 1959 will bring the total production capacity to 331,500 tons a year.

The English Electric transformer will transform 70,000 kVA. from 275 kV. to 13.2 kV. and is believed to be the largest ever built with aluminium windings. The total length of the aluminium wire, rectangular in cross section, will be well over 42 miles. The H.V. winding wire will be insulated with an appropriate number of paper layers; the L.V. wire will have an extra-heavy Formel coating. The total weight of the aluminium wire will be approximately 11,000 lb.

Alcan already has a number of aluminium-wound transformers in operation in various places, and all have given completely satisfactory service. They range in size from 220 to 20,000 kVA. Aluminium was selected for the winding material of the new 70,000 kVA. unit in order to provide an opportunity for a major electrical manufacturer to study the design and economics of aluminium in a large power transformer. This will provide practical data required for the future development of this aluminium application.

A Portable Gamma Radiation Detector

The Gamma Radiator Detector, manufactured by Baldwin Instrument Co. Ltd., is presented by the manufacturers as a reliable and sensitive Geiger Muller ratemeter which has been developed in collaboration with the Atomic Energy Research Establishment at Harwell. The instrument is designed primarily for geological prospecting with particular reference, of course, to radioactive minerals.

The principal of operation is that a Geiger Muller while mounted inside the instrument triggers cold cathode triodes which discharge small capacitors. The pulses are audible in the headphones and the mean discharge current is shown on the indicating instrument. The circuit is arranged to give approximately logarithmic calibration, and in this way the instrument covers a wide range and has a high sensitivity at low counting rate.

The instrument weighs approximately 7 lb., including G.M. tube and batteries, and is fully tropicalized so that it can be used in all climates at temperatures ranging from −20 deg. C. to +60 deg. C. The ratemeter measures 9 in. by 5½ in. by 4¾ in. It has a high sensitivity, and one milligram radius at about 25 ft. distance will normally double the counting rate.

Electrical Equipment for Mount Isa Mines

The General Elecric Co. Ltd. has received from its Australian associate, The British General Electric Co. (Pty.) Ltd., an order for an automatic electric winder for Mount Isa Mines Ltd. to be installed in their Queensland mine. The winder will be a double drum type having drums 16 ft. in diameter and will be driven through reduction gears by two 2,250 h.p. D.C. motors. The equipment is designed for a final duty of raising 12 tons of ore per wind by skips from a depth of 4,000 ft., giving an output of 350 tons per hour.

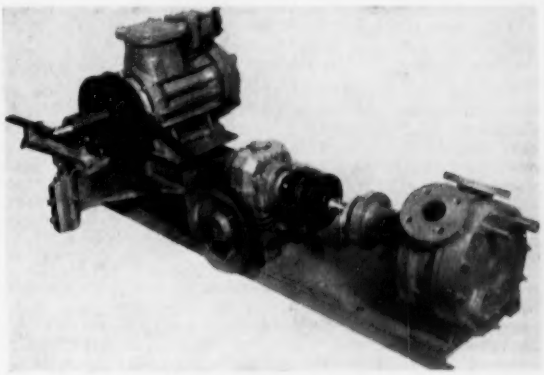
Automatic pushbutton control from twelve different levels will be provided, and the control scheme will incorporate G.E.C. control exciters operating in conjunction with a Ward Leonard Ilgner set driven by a 3,350 h.p. 3.3 kV. slipring motor. The contract includes the driver's control desk together with all the associated A.C. and D.C. switchgear and motor control gear and is valued at approximately £A200,000.

In addition, the Fraser & Chalmers Engineering Works of the General Electric Co. Ltd. have received an order from the Silvermines Lead & Zinc Co. Ltd. of Eire to supply a heavy media separation plant.

Positive Action Pumps

The operational speed of the pumping equipment manufactured by The Comet Pump and Engineering Co. Ltd. can be varied to suit the application and to increase the range of work obtainable from one pump. The pumps have many applications in many industries, one 6 in. heavy duty unit driven by a 7½ h.p. motor at a pump speed of 72 r.p.m. having successfully pumped peat.

The Comet pumping unit, incorporating the Druce-Elliott Speed Varier illustrated, is one of a batch of units supplied to the Shell Refining and Marketing Co. Ltd. The equipment consists of a 1½ in. heavy duty type Comet positive-action



A Comet pumping unit incorporating Druce-Elliott Speed Varier

pump, total ball race model, with steam jacketed cover, direct coupled to a Holroyd worm reduction gearbox. The input shaft of the gearbox is driven from a 2 h.p. Newman flameproof motor through a Druce-Elliott 4 : 1 infinitely variable speed-varier. This pump is handling many materials from heavy greases to oils. In a stalling test this pump stalled at 460 lb. pressure.

Sales of Technical Plastics

The demand for Ferobestos technical plastics manufactured by Ferodo Ltd. is severely taxing the space requirements of the producing factory. Thus, in view of the expansion needed to deal with requirements for friction products it has been decided to transfer the sale and manufacture of Ferobestos to the associated company, J. W. Roberts Ltd., who will set up near Bolton a new department entirely devoted to the development of Ferobestos technical plastics. Ferodo Ltd. and J. W. Roberts Ltd. are members of the Turner & Newall Ltd. asbestos organization.

The new arrangements came into effect on April 12, 1955, and as from that date the Ferobestos sales department of J. W. Roberts Ltd., Chorley New Road, Lostock, Bolton, will deal with all matters appertaining to Ferobestos. Branch offices are situated at London, Birmingham, Leeds and Glasgow.

An Interesting Exhibit

An interesting item at this year's R.E.C.M.F. exhibition, held on April 19 - 21, at Grosvenor House, was the Enthoven exhibit incorporating a completely equipped soldering demonstration unit designed to enable visitors to try their own hand at soldering. The particular unit was so arranged that various metal strips appearing in windows on the soldering box could be soldered on by anyone, with the respective solders and soldering irons conveniently arranged and displayed for easy use by any interested party.

METALS, MINERALS AND ALLOYS

COPPER.—Copper prices in New York did not react to the announcement that the Board of Trade was to release 45,000 tons of copper for sale in the United Kingdom. There was, however, a noticeable reduction in demand in the early part of last week. Thereafter the opinion grew that the release would not make much essential difference to the supply-demand position in the United States, and buying further hardened. Towards the end of the week, scrap refiners No. 1 wire advanced a cent from 33 to 34 c. The statistics for March, issued by the Copper Institute at the same time as the news of the release came through from London, did much to prove the assertion that the tight supply in the U.S. was likely to remain.

The outstanding feature of the March figures was an increase in deliveries to domestic consumers from 108,503 tons in February to 130,586 tons in March. This rate of delivery is the highest since June, 1953, when a total of 139,300 tons was reached. Production of crude copper from mines' output reached 98,900 tons which was the largest monthly output since March, 1953. World output from mined sources reached 233,170 tons, an increase of about 30,000 tons in February. March production of refined copper in the U.S. reached 134,933 tons which was 11,800 tons up on the previous month and is believed to be an all-time record. World refined production reached 236,758 tons, an increase of 24,000 tons.

The Commerce Department and other agencies of the Administration have recommended to the House Ways and Means Committee that the copper import duty of 2 c. per lb. be suspended until June 30, 1958. The suspension under existing authority runs out on June 30 this year. The Ways and Means Committee is expected to take up the matter of copper import duty immediately. The Administration has argued that not to renew the duty would cause higher prices for imported copper and might also involve an actual loss in imports.

Not unnaturally, the Chilean Government is put out by the release of 45,000 tons of British-owned copper, and there have been reports from Santiago that the Chilean authorities are considering diverting copper sales from the United Kingdom to the United States and elsewhere. No great importance is attached to these reports, for it is believed that the output of the American-owned plants has been sold as far forward as October 1, with 60 per cent of sales being made to Western European countries.

Meanwhile, the Chilean Government is making every effort to increase mine output to take advantage of the current high level of copper prices. The Ministry of Mines has said that the first quarter production reached 102,000 tons and that over the year copper production will exceed 400,000 tons. Both Anaconda and Braden Copper companies have announced plans to increase output at their Chilean plants. Anaconda has been authorized to operate the copper mine La Africana, near Santiago, with an initial investment of $2,000,000. The mine would start operating within 12 months, with an output of 1,200 tons a month of 25 per cent copper ore concentrates. Output would later increase to 20,000 tons a year. Concentrates would be processed in the smelter at present belonging to the French company, Mzaita, which the government is now proposing to purchase. Braden is about to conclude an agreement to invest nearly $2,000,000 in extending its El Teniente property which would permit an increase in the year's output of 10,000 tons, and by 1956 probably of 25,000 tons. El Teniente's output in February at 11,600 tons of blister and fire-refined was a record. A Canadian firm, United Satamin Ltd., has been granted authority to invest $3,000,000 in exploring and exploiting a group of mines near Iquique, in Northern Chile.

With all these plans afoot and with Rhodesia left some way behind by the strike at the beginning of the year, it would not be impossible for Chile to regain the position of world's second largest copper producer, a position which she has not held since 1952. However, there is a cloud on the horizon. It is reported that negotiations for a new wage agreement at Potrerillos are near to breaking down and that a strike was due to start on April 20. It is said that the difference between the workers' claims and the company's offer is still 100,000,000 pesos a year. It has also been suggested that if Potrerillos were struck, the men at Chuquicamata and at the ports of Tocopilla and Antofagasta would come out in sympathy, in spite of the fact that they have only recently reached a settlement themselves.

Anaconda Copper Company has reported a new orebody at its Butte Montana properties which might become a major low-grade mine worked opencast. A potential ore reserve of about 100,000,000 tons has already been indicated.

LEAD.—The strong demand for lead which has grown up in the United States at the price of 15 c. per lb. New York continues unabated. Buying has been extremely general with all classes of users joining in. The figure for sales of United States domestic lead reached 14,000 tons in the week ending April 13, an increase of 3,300 tons on the preceding week, which in itself was considered to be quite good. *Wall Street Journal* has noted that a feature of current dealings is the desire of buyers to place orders for April/May delivery at the market level of 15 c. per lb., rather than at the average price during the month of delivery. This is a customary move whenever a rise in prices seems likely. With current demand so vigorous, with the example of a recent increase in zinc, and with the continuing firmness and tightness of copper, a rise in the price of lead could certainly not be ruled out.

However, it does not follow that the lead producers would themselves welcome it at this particular time. Firstly, they are busy making out a Protectionist case in Washington and do not wish to appear unduly prosperous; secondly, there is a genuine feeling that stability would be an excellent thing for the lead industry and producers have noted the temporary falling off in demand for zinc since the price of that metal rose by ½ c.; and thirdly, it has commonly been thought (though it has never been officially stated), that stockpiling might be suspended if the price of lead were to go above 15 c.

Meanwhile the government has again entered the market for its usual monthly purchase of lead and zinc but it is thought that offerings of lead, which would be due for delivery by June 15, may be cut by as much as a half by the present excellent commercial demand.

ZINC.—The zinc market has remained quiet and firm in the United States on the basis of 12 c. per lb. East St. Louis, for Prime Western grade. There has been, however, a noticeable falling off in buying during the past week, sales, compared with those of the past two months, being extremely light. The situation has indeed reverted to that which existed a couple of months ago, with demand for zinc concentrated very heavily on the special high grades, which are still in extremely tight supply. There is no reason to suppose, however, that this is any other than a normal pause in market operations following a price rise and customers should soon revert to their old buying habits. The government has again asked for deliveries to the stockpile by June 15, but it is not expected that offerings will approach the 15,000/17,000 tons which were commonly offered last year. Indeed, it is thought by knowledgeable observers that by the middle of the year G.S.A. will have bought only 170,000 tons against the 300,000 tons which it was authorized to purchase.

Meanwhile, it is reported that Mr. Flemming, director of the Office of Defence Mobilization, will seek advice shortly from the Secretary for the Interior, Mr. McKay, Secretary for Commerce, Mr. Weekes, and the Secretary of State, Mr. Dulles, on whether the programme for stockpiling domestic lead and zinc should be continued. Together, these officials constitute the President's Cabinet Committee on minerals policy. *Reuter* reports that there is a division of opinion among government officials on the advisability of continuing the present buying programme. This is not surprising, in view of the rumours, statements and denials which have been made by officials in the past few weeks.

TIN.—Tin has been a more interesting market in the United States than for some time past and the price for spot metal which stood at 91.3 c. per lb. on April 14, worked itself up in four stages to 92.37 c. The background to the rise is the continuing growth in tin consumption, which, on a daily average basis increased 17 per cent in February and was 400 tons up on January, in spite of being a short month. February consumption totalled 7,280 tons. Tin stocks increased on the month from 36,400 to 37,000 tons but the stocks of pig tin held by industry actually declined.

Meanwhile, the prospects for tinplate consumption become brighter almost day by day. It is now believed that the current high level of output will be maintained throughout the third quarter, partly because the demand for cans for beer and soft drinks is better than anticipated, partly because there is increasing confidence that the United Kingdom will have to buy more tinplate to maintain her export finances, and partly because customers are anxious to place orders and get delivery before a rise in steel workers' wages pushes up the price structure for steel. It is indeed thought that if Britain were to place further tinplate orders now there would be some difficulty in coping with them much before the end of the year.

Although at one time it was thought that wage demands in

the steel industry would almost inevitably lead to a strike, the opinion is now growing that with the steel industry operating at near to capacity output, it will be able to afford an increase.

It is announced that the Senate Committee has recommended that the government should operate the Texas City smelter until June 30, 1956. The Committee was a Sub-Committee of the Banking and Armed Services Committee, and it has taken evidence from most of the government agencies. It has added a rider to its recommendation, that after June 30, 1956, the smelter should be sold or leased to private interests. The resolution will now come up before Congress to be approved.

The interesting feature of the whole business is, of course, that the report on which the Committee's recommendation is supposed to have been based has not been published, nor has any publication date been set. It has commonly been said that most of the government agencies which were asked to give evidence recommended that the tin smelter should not be kept operating. Nathan Trotter & Co. has in fact suggested that the report should be "smoked out" and published. It should be remembered that last year a decision was taken that the smelter should be kept in operation until June 30, 1955, while Congress studied the "essentiality" of the smelter. But if, in fact, Congress is not going to publish the reports of investigations into this so-called essentiality, there is no reason why the Texas smelter should not be kept going year after year.

ALUMINIUM.—According to the Oslo paper *Morgenbladet*, a new Norwegian plant is to be put up at Mosjoeen, in the north of Norway. The plant is scheduled to have a capacity of 20,000 tons of aluminium per year, with production commencing in 1958. The plant will be built by Elektrokemisk, although one-third of the finance is being found by the Swiss company, Aluminium Industrie A.G.

MANGANESE.—Due to its dependence on foreign high grade manganese producers, the U.S.A. would be in a "perilous position" if there were an outbreak of war at this time, witnesses have told the Senate Sub-Committee on Strategic Materials and Metals. This would appear to be the compelling reason supporting the rumours that Congress is considering instituting some form of price incentive to encourage private industry to compete for the development of an economical process for upgrading domestic manganese ore to make the U.S. less dependent on foreign supplies of high grade manganese. It is understood that the processes so far known for upgrading domestic manganese were uneconomical. However, this is not the view of the U.S. Bureau of Mines experts, who told the Sub-Committee that "feasible processes" for upgrading domestic manganese had been discovered in their research projects.

URANIUM.—A report from San Francisco states that eighteen samples of ores taken from Californian gold mines have indicated, under test, that uranium might be present in commercial quantities at the source of the ores. The eighteen samples were among 8,000 tested by government officials.

GOLD.—According to an agency message a small amount of gold has been sold on the London market from Soviet sources. The quantity involved was not sufficient to influence prices. This is the first occasion on which the Russians have sold gold in London for about a year.

The London Metal Market

(From Our Metal Exchange Correspondent)

The depressing influence of the U.K. government's announcement that they were going to sell copper wore off when it was realized that the delivery and pricing of the 45,000 tons electro were to be spread out over the rest of this year. The price recovered on good buying both from this country and from Europe, and the upward movement was helped by rumours of a new strike in Chile, which, however, it is hoped will now be averted.

As mentioned in our last article nearby metal remains at a premium, and this has been one of the factors in raising the general price level. Opinion in the market seems to be that the price of copper will vary within fairly narrow limits on either side of about £320 per ton for the next month or so, and the next major movement will either be caused in an upward direction by new strikes or in a downward direction by the availability of additional tonnages of copper about the middle of the year.

To-day's announcement that the Government have sold back a further 20,000 tons of blister copper to the Rhodesian producers' agents came as a shock to the market, but after an initial fall a firmer undertone developed and there is no reason to suppose that this news will have any lasting effect in view of the overall shortage.

There have been no features in the tin market and no news from Indonesia of any decision on the question of the signing of the new Tin Agreement. From America comes the news that a recommendation has gone forward that the Texas smelter should be operated for another year, during which time it should be sold as a going concern to private enterprise, and if this is agreed by all the authorities concerned it should look after a proportion of the production from Indonesia in addition to the Bolivian concentrates. On Thursday morning the Eastern price was equivalent to £732½ per ton c.i.f. Europe.

The lead market has been more active than of late with a slight rise in the price level, but it is difficult to see how there can be any substantial rise with demand and production so nearly in balance, especially as it appears the U.S. government is prepared to continue buying lead for some time to come only if the price does not increase.

The zinc market has also had a firm undertone, probably arising from news that the U.S. government's purchases will continue and from the overall shortage of the higher grades which now seems to be common throughout the world.

Closing prices and turnovers are given in the following table (only 4 market days in week to April 14):—

	April 14		April 21	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£305	£305½	£321½*	£322½
Three months	£300	£300½	£310	£311
Settlement	£305½		£322½	
Week's turnover	9,050 tons		8,575 tons	
Tin				
Cash	£715½	£716	£717½	£719
Three months	£716	£717	£718½	£719
Settlement	£716		£719	
Week's turnover	260 tons		625 tons	
Lead				
Current half month	£104½	£104¾	£104½	£104¾
Three months	£104¼	£104½	£104¼	£104½
Week's turnover	2,725 tons		4,725 tons	
Zinc				
Current half month	£90	£90½	£89	£89½
Three months	£88	£88¼	£87¾	£88
Week's turnover	2,650 tons		4,250 tons	

OTHER LONDON PRICES — APRIL 21

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £210 per ton
Crude (70%) .. .. .. £200 per ton
Ore (60% basis) .. .. 22s./24s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £519 per ton

OTHER METALS

Aluminium, 99.5%, £163 per ton
Bismuth (min. 2 cwt. lots) 16s. lb.
Cadmium (Empire) nominal
Chromium, 6s. 5d./7s. lb.
Cobalt, 21s. lb.
Gold, 250s. 7½d.
Iridium, £30/£32 oz. nom.
Magnesium, 2s. 4d. lb.
Manganese Metal (96%-98%) £255/£265 according to quantity
Osmiridium, £40 oz. nom.
Osmium, £30 oz. nom.
Palladium, £6 5s./£6 15s. oz.
Platinum, £27/£27 15s.
Rhodium, £41
Ruthenium, £16 oz.
Quicksilver, £108 10s./£109 ex-warehouse
Selenium, 43s. nom. per lb.
Silver, 75½d. f.oz. spot and 75½d. f'd
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 65% 8s. 6d. lb. c.i.f.
60% 8s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (semi-friable) 48% £13 per ton c.i.f.
,, Refractory 45% .. £13 per ton c.i.f.
,, Smalls 42% .. £10 2s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26-£27 d/d
Magnesite, Raw .. .. £10-£11 d/d
Molybdenite (85% basis) .. 105s. 3d.-108s. 1d. per unit c.i.f.
Wolfram and Scheelite (65%) .. 220s./225s. c.i.f.
Tungsten Metal Powder (98% Min. W.) .. 17s. 9d. nom. per lb. (home)
Ferro-tungsten (80%-85%) .. 14s. 9d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £37 6s. 3d. d/d per ton
Ferro-manganese, home .. £53 17s. 6d. per ton
Manganese Ore Indian c.i.f. Europe (46%-48%) .. .. 76d./78d. per unit
Manganese Ore (38%-40%) .. 64d./66d. per unit
Brass Wire .. .. 3s. 0½d. per lb. basis
Brass Tubes, solid drawn .. 2s. 6½d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

This week there has been much of interest going on in the financial life of the country, but paradoxically, there is little activity to report from the Stock Exchange. The market remained substantially firm in face of the budget and the announcement of the general election, but both these factors, together with the absence of newspapers, caused a period of stagnant trading. The budget itself is likely to be considered as encouraging, but the prospect of an election is likely to keep the market in its present condition for some time to come. A bull point for the national economy has been the strength of sterling in overseas markets.

Mining markets were no exception to the general trend and were quiet. Among Kaffir finance houses, there was some demand for Consolidated Goldfields, Central Mining and West Rand Investment Trust, all of which have a high investment status. Consolidated Mines Selection also recovered from their recent low level. General Mining, however, failed to respond to last year's advance in earnings.

Among the individual Rand mines, price movements were erratic and mainly small. Where improvement took place, this was mostly in the older mines, buyers apparently basing their hopes on the improved supply of native labour. In some quarters, however, doubts were expressed whether sufficient skilled Europeans were available to take full advantage of this favourable factor. While Randfontein hardened, some of the other uranium producers fell away. It now seems that it may be some time before the mines can fully benefit from uranium production and at the same time compensate lost gold output. West Rand Consolidated disclosed that another vertical shaft will be sunk with the object of developing uranium bearing reef; this will cost some £500,000 and will probably have to be financed out of profits.

In the Orange Free State, the outlook for Freddies Consolidated was still considered most uncertain and the shares were avoided. Buyers, however, appeared for Free State Geduld which have recently fallen sharply. Both Geoffries and Middle Witwatersrand turned easier; recent developments in the Orange Free State have created unfavourable conditions for the joint flotation of any new property by these two companies. Orange Free State Investment Trust improved in sympathy with Free State Geduld; this company holds interests in the more promising Orange Free State properties. The decision by Anglo American Corporation to lend a substantial sum of money to Welkom for further development encouraged these shares but the intention to sink a new shaft and develop the southern portion of the property suggests that it may be imperative to seek higher values than those which have already been exposed by underground work. It is believed that this company has suffered considerably from water trouble.

In the West African market, there was little of interest to report but Ariston gained the turn on being quoted ex dividend and there was some quiet buying of Ashantis.

In the miscellaneous gold section, prices generally declined through lack of interest, but the further fall in St. John del Rey was occasioned by changes in the Brazilian Government which were unfavourably commented upon abroad.

Coppers were erratic. At the beginning of the week there was a substantial recovery in the metal price to around £335 per ton. Share prices generally were slightly easier, but the underlying tone was steady. The investment status of Chartered reasserted itself and the rapid development of world wide interests by Rio Tinto caused a sharp advance in the shares.

Eastern tin shares were featureless and price changes, where they occurred, were mainly nominal. Similar conditions existed in the Nigerian market and the only feature was a fall in British Tin Investment.

There was rather more activity among lead/zincs and some of the leading Barriers went ahead. Consolidated Zinc led the way. Mount Isa, due to its important copper interests, declined against the general trend.

Among miscellaneous base metal shares, South African Collieries and Wankie improved as did Turner and Newall.

Movements in Canadian shares were irregular, but Noranda remained firm and Hollinger were a very good feature with a sharp rise in price. Big developments of the company's iron ore interests can be expected during this summer.

FINANCE	Price April 20	+ or — on week
African & European	3½	—⅛
Anglo American Corpn.	7½	
Anglo-French	20/7½	
Anglo Transvaal Consol.	27/6	—7½d
Central Mining (£1 shrs.)	43/3	+1/6
Consolidated Goldfields	58/9	+7½d
Consol. Mines Selection	38/1½	+7½d
East Rand Consols	2/4½	—4½d
General Mining	5⅞	—⅛
H.E. Prop.	9/7½	
Johnnies	37/6	6d
Rand Mines	3⅜	—⅛
Rand Selection	42/6	
Union Corporation	42/3	—9d
Vereeniging Estates	4⅛	—⅛
Writs	42/6	+1/3
West Wits	37/-	—9d
RAND GOLD		
Blyvoors	28/9	—6d
Brakpan	6/6	..
Buffelsfontein	35/-	+6d
City Deep	12/6	+6d
Consol. Main Reef	20/7½	+1/1½
Crown	46/3	+7½d
Daggas	57/6	—7½d
Dominion Reefs	36/-	+6d
Doornfontein	28/3	—9d
Durban Deep	33/9	
E. Champs	8/6	—6d
E. Daggas	10/9	+3d
E. Geduld (4s. units)	28/3	
E. Rand Props	2½	—⅛
Geduld	3⅜	
Govt. Areas	10/3	
Grootvlei	21/-	+6d
Hartebeestfontein	31/6	—6d
Libanon	8/6	+4½d
Luipaards Vlei	22/6	—9d
Marievale	21/3	
New Kleinfontein	8/3	—3d
New Pioneer	15/3	
Randfontein	63/6	+6d
Robinson Deep	17/6	+9d
Rose Deep	14/-	+9d
Simmer & Jack	4/1½	
S.A. Lands	23/9	+1/3
Springs	2/6	—1½d
Stilfontein	26/3	
Sub Nigel	36/10½	
Vaal Reefs	30/9	—3d
Van Dyk	4/-	
Venterspost	12/-	
Vlakfontein	17/-	+3d
Vogelstruisbult	33/9	—1/-
West Driefontein	5⅜	+⅛

RAND GOLD contd.	Price April 20	+ or — on week
W. Rand Consolidated	43/1½	—7½d
Western Reefs	42/6	—9d
O.F.S. GOLD		
Freddies	4/3	+3d
Freddies Consolidated	6/-	
F.S. Geduld	4⅜	+⅛
Geoffries	16/-	—6d
Harmony	34/3	—1/6
Loraine	10/-	—6d
Lydenburg Estates	20/-	
Merriespruit	12/-	—1½d
Middle Wits	16/3	—3d
Ofsits	3⅜ *	+⅛
President Brand	68/9	—9d
President Steyn	40/3	—3d
St. Helena	27/9	—9d
Virginia Ord.	14/3	+3d
Welkom	21/9	+9d
Western Holdings	4½	+⅛
WEST AFRICAN GOLD		
Amalgamated Banket	2/4½	
Ariston	6/-XD	—1½d
Ashanti	22/3	+3d
Bibiani	4/10½	
Bremang	1/4½	—1½d
G.C. Main Reef	3/3	
Kononga	2/9XD	+1½d
Lyndhurst Deep	1/4½	+1½d
Marlu	10½d.	—1½d
Taquah	2/7½	—1½d
Western Selection	8/9XR	+1½d
AUSTRALIAN GOLD		
Gold Mines of Kalgoorlie	12/3	+3d
Great Boulder Prop.	9/1½XD	
Lake View & Star	15/6	
Mount Morgan	19/6	+3d
North Kalgurli	7/-	—3d
Sons of Gwalia	4/6	—6d
Western Mining	9/9	—3d
MISCELLANEOUS GOLD		
Cam & Motor	8/3	
Champion Reef	4/-	
Falcon Mines	7/1½	—1½d
Globe & Phoenix	26/-	
G.F. Rhodesian	6/-	—3d
Motapa	1/4½	—1½d
Mysore	4/9	—1/-
Nundydroog	6/-	—6d
Ooregum	4/3	—1½d
St. John d'El Rey	12/6	—3d
Zams	51/-	—1/6

DIAMONDS & PLATINUM	Price April 20	+ or — on week
Anglo American Inv.	8½	
Casts	23/9	—3d
Cons. Diam. of S.W.A.	7	
De Beers Defd. Bearer	5⅜	—⅛
De Beers Pfd. Bearer	15½	—⅛
Pots Platinum	9/-	+9d
Waterval	14/4½	
COPPER		
Bancroft	43/-	—9d
Chartered	58/6XB	+6d
Esperanza	4/6	
Messina	8¾	—⅛
Nchanga	13⅛	—⅛
Rhod. Anglo-American	97/6	—2/6
Rhod. Katanga	19/-	—6d
Rhodesian Selection	34/3	
Rhokana	38⅛	—⅛
Rio Tinto	54	+3½
Roan Antelope	26/1½	—7½d
Selection Trust	70/7½	—4½d
Tanks	7⅛	
Tharsis Sulphur Br.	5⅛	—⅛
TIN (Eastern)		
Ayer Hitam	27/3	
Gopeng	7/7½	+1½d
Hongkong	7/6	—4½d
Ipoh	21/9	
Kamunting	7/-	+1½d
Kepong Dredging	3/1½	
Kinta Tin Mines	11/6	
Malayan Dredging	8/3	+1½d
Pahang	11/9	+3d
Pengkalen	10/4½	
Petaling	9/3	
Rambutan	17/-XD	—9d
Siamese Tin	5/6	—1½d
Southern Kinta	17/6	
S. Malayan	7/4½	+3d
S. Tronoh	10/6	—1½d
Sungei Kinta	11/3	
Tekka Taiping	6/4½	—7½d
Tronoh	7/6	
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	13/7½	+1½d
Beralt Tin	30/3	
Bisichi	7/1½	+1½d
British Tin Inv.	19/3	—6d
Ex-Lands Nigeria	2/6	
Geevor Tin	12/7½	+3d

TIN (Nigerian and Miscellaneous) contd.	Price April 20	+ or — on week
Gold & Base Metal	2/6	
Jantar Nigeria	8/1½	
Jos Tin Area	13/9	
Kaduna Prospectors	2/6	
Kaduna Syndicate	2/6	
London Tin	7/7½	—1½d
United Tin	3/-	
SILVER, LEAD, ZINC		
Broken Hill South	51/3	+1/3
Burma Corporation	2/6	—1½d
Consol. Zinc	46/3	+1/3
Lake George	12/-	—4½d
Mount Isa	50/6	—1/-
New Broken Hill	34/7½	—7½d
North Broken Hill	71/-	+1/-
Rhodesian Broken Hill	11/10½	—4½d
San Francisco Mines	22/7½	—10½d
Uruwira	5/10½	—1½d
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	49/6	+1/-
Associated Manganese	38/9	
Cape Asbestos	11/6	—3d
C.P. Manganese	40/-	
Consol. Murchison	62/6	
Natal Navigation	2⅛	+⅛
Turner & Newall	108/6	+2/-
Wankie	19/9	+1/3
Witbank Colliery	4½	
CANADIAN MINES		
Dome	$30	
Hollinger	$39	—4
Hudson Bay Mining	$107½	—2½
International Nickel	$116⅛	—⅜
Mining Corpn. of Canada	£6⅛	
Noranda	$168	+1
Quemont	£8½	+½
Yukon	4/1½	—1½d
OIL		
British Petroleum	75/6	—6d
Apex	28/-	
Attock	45/-	—1/3
Burmah	5⅛	
Canadian Eagle	51/3	—1/3
Mexican Eagle	20/6	—1½d
Shell	6½	—⅜
Trinidad Leasehold	32/-	+3d
T.P.D.	24/3	—1/3
Ultramar	28/-	—9d

COMPANY NEWS AND VIEWS

Rand And O.F.S. March Quarterlies

Of several interesting disclosures contained in the March quarterly reports so far received in respect of the Anglo American Corporation. Union Corporation, General Mining, and Johannesburg Consolidated Investment, perhaps the lack of any confirmation that recent adverse rumours concerning Loraine and Free State Geduld are true, will be particularly well received by the market.

Indeed, far from reporting underground difficulties, it has been announced that at Loraine the two shafts were connected last week; while a record development footage was accomplished during the quarter. In respect of Free State Geduld good values in the drive, extended into the property from Western Holdings, continued to be obtained and of the 175 ft. sampled all proved payable, averaging 1,665 in. dwt. On the other hand, overall figures from the mine showed a drop in values from 995 in. dwt. to 703 in. dwt. Payability also fell from 97 per cent to 90 per cent.

The high development values reported from President Brand of 1,227 in. dwt. as compared with 1,002 in. dwt. previously was particularly significant. Recent development at this property has been mainly concerned with the area between the two shafts about which little is yet known. A rise in development values under these conditions must be regarded as most encouraging. Besides this, both Presidents Brand and Steyn have announced maiden uranium profits. These amounted to £23,000 and £35,600 respectively, but reflected no provision for redemption of uranium loans. From St. Helena came an exceptionally good development announcement. At this property, values rose from 375 in. dwt. to 417 in. dwt. while payability also advanced from 54 per cent to 59 per cent.

Amongst the established producers, Brakpan reported a much increased development footage sampled at 11,420 ft. as compared with 9,455 ft. previously. Payability rose from 28 per cent to 30 per cent and values from 584 in. dwt. to 626 in. dwt. Good development results were also announced in respect of Daggafontein and East Daggafontein.

At West Rand Consolidated, a sharp rise also took place in uranium revenue from £651,218 to £739,907. Randfontein disclosed net revenue from uranium and acid of £797,000 which compared with £641,000 previously and represented the highest uranium earnings yet reported.

Union Corporation's Sharp Rise In Investment Values

The main feature of the full report and accounts now published by Union Corporation was the sharp rise in the market value of quoted investments from £16,253,827 to £20,115,058. The liquid position was maintained at virtually the previous year's level. As at December 31, 1954, net liquid assets stood in the region of £9,600,000. The comprehensive and widely known Trade Cycles Chart published with the report covering economic trends from 1796 to 1954 continues to be of the greatest interest.

As already announced in the company's preliminary profit statement (see *M.J.* March 25, page 335), despite a decline in profits earned the total distribution was raised. The consolidated profit and loss account for the past financial year showed net profits at £1,104,248 as compared with £1,238,628 previously. Dividends paid in respect of the year amounted to a gross total of 2s. 8.909d. as against the preceding figure of 2s. 5.091d.

Some interesting information has been given regarding exploration activities in the Far Eastern Rand. Drilling by Capital Mining Areas during the past year has indicated that the area underlain by payable Kimberley Reef is larger than that previously visualized. Drilling operations continue. And it is anticipated that during the current year the corporation may be in a position to apply for a mining lease over part of the area. In addition, one of the corporation's subsidiary exploratory companies operating adjacent to Capital Mining Areas has reported encouraging values from the Kimberley Reef. But no other subsidiary companies in the Bethal or adjoining districts In addition, one of the corporation's subsidiary exploration have yet encountered deposits of economic interest.

Meeting, Johannesburg, May 24. Lord Bracken is chairman.

General Mining Maintains 25 Per Cent

With the declaration of a final dividend of 15 per cent on the issued ordinary capital of £1,052,134 in £1 shares, the General Mining and Finance Corporation has maintained its total distribution for the year ended December 31, 1954, at 25 per cent. The 381,608 "S" ordinary shares, which were recently issued in connection with the acquisition by the company of Strathmore Consolidated Investment, do not participate in dividend distributions in respect of the year 1954.

Subject to audit, the profit for the year after providing for taxation, and including £451,684, arising from sharedealing, was £1,147,382, as compared with £837,657 for the previous year. Of this figure £274,183 was utilized to write down investments, and £277,679 was transferred to reserves.

Sir George Albu is chairman and managing director.

Vereeniging Estates Maintains Profits and Dividend

Operations carried out during the year ended December 31, 1954, by the Vereeniging Estates resulted in only a fractional increase in total revenue from that of the preceding year. Net profit from mining, manufacturing and other operations, brought in £2,281,959 as compared with £2,254,916, while investment income provided £105,613 as against £87,522 previously.

Year to Dec. 31	*Total Revenue* £(000)	*Taxation* £(000)	*Net* Profit* (£000)	*Dividends* (£000)	*To Reserve* £(000)	*Carry Forward* £(000)
1954	2,387.6	611.8	1,061.2	825.0	100.0	716.4
1953	2,342.4	638.1	953.6	825.0	Nil	580.2

*After £780,906 appropriated by subsidiary companies. (1953 - £872,878)

Dividends totalling 30 per cent were paid on the issued ordinary capital of £2,750,000 and thereby remained unchanged from those of the preceding year.

Amongst the company's subsidiaries are the Amalgamated Collieries of South Africa, the Union's largest coal producer, and its participation in industry is represented by a substantial shareholding in the Vereeniging Brick and Tile Co. Mr. T. Coulter is chairman and managing director. Meeting, Johannesburg, June 2.

Vereeniging Brick and Tile Earns More, Pays Same

The demand for refractories, salt-glazed ware, and building brick produced by Vereeniging Brick and Tile Co. during the year ended December 31, 1954, remained at a constantly high level throughout the year. Accordingly, total profits earned showed a substantial rise over those of the preceding period.

Year to Dec. 31	*Total Profit* £	*Taxation* £	*Net Profit* £	*Dividends* £	*To Reserve* £	*Carry Forward* £
1954	501,792	140,089	341,812	277,500	50,000	134,071
1953	442,060	137,622	298,867	277,500	Nil	119,759

Dividends on the issued ordinary capital of £1,250,000 in ordinary shares of 5s. remained unchanged at 25 per cent. Mr. T. Coulter is chairman. Meeting, Johannesburg, June 2.

Vaal Reefs to Offer 3 for 10 at 30s.

A further sum of £4,400,000 is required in order to bring the Vaal Reefs Exploration and Mining Co. into production by 1956. This will provide for an eventual milling capacity of 75,000 tons per month. Members will, therefore, be offered the right to subscribe for 2,190,000 shares of 5s. at 30s. per share in the proportion of 3 new shares for every 10 held on April 29, 1955. This issue has been underwritten by the Anglo American Corporation of South Africa for a cash commission of 2½ per cent on the issue price of 30s. In addition, the Corporation has agreed, in consideration of a cash commission on the same

REQUIRED SHORTLY

MILL FOREMAN/ASSAYER

to take charge of 200 ton per day Gravity-cum-Flotation Mill **in Great Britain.** Minimum salary £70 per month, more according to experience and qualifications. Free accommodation may be arranged for married man. A degree or diploma in metallurgy or mineral dressing an advantage but not essential. Apply Box 568, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2.

terms, to subscribe or find subscribers for a further 510,000 shares of 5s. each, at a price of 30s. per share. These operations will provide £4,050,000 and it is the company's intention to finance the remaining £350,000 by temporary borrowings.

Middlevlei's Prospecting Operations

Following an agreement entered into between Middlevlei Estate and Gold Mining Co. and Venterspost Gold Mining Co., in order that the first named company might carry out prospecting operations over a portion of farm Middlevlei No. 28, it has been announced that preliminary operations have commenced.

As a preliminary step Venterspost's ninth level drive north is being extended initially as a cross-cut to the Ventersdorp Contact Reef and then as a drive to the boundary. By March 31, 1955, this drive had been advanced a total of 334 ft., certain delays having been occasioned by the necessity of sealing off water encountered. This trouble has also been experienced in the cross-cut, and a heavy water-bearing zone is being traversed—an amount of approximately 40 ft. has yet to be driven before the Ventersdorp Contact Reef is intersected. At that point, the distance to the common boundary into Middlevlei No. 28 is approximately 600 ft. The company's proportion of expenditure involved in this work has so far been £10,794 of which £6,816 was in respect of equipment.

Amalgamated Collieries Maintains Earnings

Coal mining profits earned by Amalgamated Collieries of South Africa during the year ended December 31, 1954, declined. But this was more than offset by dividend and interest income.

Year to Dec. 31	*Total Coal*	*Revenue Divs. etc.*	*Taxation*	*Net* Profit*	*Dividends*	*Carry Forward*
	£	£	£	£	£	£
1954	785,417	108,667	209,497	578,429	500,500	375,794
1953	801,383	85,854	211,029	433,648	500,500	282,137

*After writing off £17,923 (1953 - £158,729).

Dividends on the issued ordinary capital of £2,860,000 in shares of £1 were maintained at the previous year's level of 17½ per cent. Mr. T. Coulter is chairman. Meeting, Johannesburg, May 20.

Rix-Athabasca's Maiden Profits

During the period from April 7—the date on which shipments commenced—up to December 31, 1954, the end of its financial year, Rix-Athabasca Uranium Mines, the Canadian uranium ore producer, earned a net profit of $21,191.09. This figure was struck after the deduction of mining and other expenditure of $304,938.69, depreciation and preproduction expenses of $288,511.62 and taxation of $400.

UNION CORPORATION, LIMITED

(Incorporated in the Union of South Africa)

ABRIDGED REPORT OF THE DIRECTORS FOR YEAR 1954

After providing £502,800 for United Kingdom taxation the profit for the year is £1,081,279, plus £358,791 brought forward, making a total of £1,440,070. The Directors have placed £275,000 to the credit of Exploration Reserve Account and £81,000 to Pension Fund Account and have declared a final dividend of 1s. 10d. United Kingdom currency per share, less United Kingdom Income Tax, absorbing £468,875, leaving £382,695 to be carried forward.

For the last eight years dividends have been declared free of tax. There is reason to believe that this method has led to confusion in the calculation of yields and accordingly it has been decided to revert to the more normal method whereby the dividend is declared gross and paid after deduction of United Kingdom Income Tax at the standard rate. The final dividend of 1s. 10d. per share less tax was declared on March 23, 1955, and makes, with the interim dividend (6d. per share free of tax), a total dividend of 2s. 8.909d. per share less tax for the year compared with 2s. 5.091d. per share less tax for the previous year.

Holdings of shares, debentures and other securities have been taken into the Accounts at cost or under but in no case above the market value of December 31 last, or, where no market price exists, above the Directors' valuation. The Directors, as on other occasions, have thought it expedient to write down the book cost of certain holdings below both cost and market price.

The Directors record with deep regret the death on November 5 last of Mr. P. M. Anderson, Deputy Chairman and Managing Director of the Corporation. Mr. T. P. Stratten, who has been Deputy Managing Director since November 1950, has succeeded Mr. P. M. Anderson as Managing Director.

A copy of the Corporation's Annual Trade Cycles Chart, revised to date, is enclosed with the Report.

GOLD MINING INTERESTS

Summary of the operating results for the past year of the Companies operating in the Transvaal and Orange Free State in which the Corporation is largely concerned :—

	East Geduld Mines Ltd.	Geduld Proprietary Mines Ltd.	The Grootvlei Proprietary Mines Ltd.	Marievale Consolidated Mines Ltd.	St. Helena Gold Mines Ltd.	Van Dyk Consolidated Mines Ltd.
Tons Milled	1,663,000	1,122,000	2,185,000	800,000	1,041,000	940,000
Yield per ton (dwt.)	6.15	3.27	4.27	5.10	4.52	3.43
Working Costs per ton	31s. 5d.	33s. 11d.	29s. 2d.	40s. 4d.	41s. 10d.	42s. 5d.
Working Profit per ton	45s. 4d.	6s. 11d.	24s. 1d.	23s. 3d.	14s. 7d.	5d.
Total Working Profit	£3,770,000	£386,000	£2,633,000	£930,000	£758,000	£20,000
Net Profit	£1,772,000	£935,000	£1,274,000	£487,000	£687,000	£23,000
Dividends : Total	£1,687,000	£895,000	£1,192,000	£450,000	—	—
Per stock unit or share	3s. 9d.	12s. 3d.	2s. 1d.	2s. 0d.	—	—

The net profit figures include revenue from other sources. Thus East Geduld Mines' dividend income in 1954 on its shareholding in The Grootvlei Proprietary Mines was £56,000 and Geduld Proprietary Mines' dividend income in 1954 on its shareholdings in East Geduld Mines and The Grootvlei Proprietary Mines was £657,663.

ST. HELENA GOLD MINES. It has been decided to sink a vertical shaft (No. 2) to a depth of about 5,500 ft. to serve the North-Eastern section of the property, and to extend the reduction plant by a further 50,000 tons to a total capacity of over 150,000 tons per month. Half of this extension should be in commission by the end of the current year and it is planned to instal the balance after the new shaft has been completed. The cost of the new shaft and the extensions to the reduction plant will be financed by the Company out of profits. The ore reserves at December 31 last were estimated to amount to 2,750,000 tons, assaying 5.9 dwt. per ton over a stoping width of 55 in.

THE WITHOK PROPRIETARY COMPANY.—The Corporation retains a substantial interest in the Company which owns the mineral rights over 4,828 morgen on the Farm Withok No. 7, District Brakpan, Transvaal, and certain freehold rights thereon.

Interests in Gold Mining Companies not under the administration of the Corporation :—

STILFONTEIN GOLD MINING COMPANY.—Profits increased steadily during the year and the Company declared a maiden dividend of 6d. per share in December last. The capacity of the reduction plant is being extended to 115,000 tons per month.

WESTERN HOLDINGS.—The Company made impressive progress during the year under review and is earning substantial working profits. Development work on the basal reef horizon continues to disclose high payability with good values.

OTHER MINING INTERESTS

SAN FRANCISCO MINES OF MEXICO.—This Company earned a Working Profit of £765,000 in the year ended September 30, 1953, and paid a dividend of 4s. per 10s. Stock unit in respect of that year. In the year to September 30, 1954, a record tonnage of 738,800 tons of ore were treated. The results of operations for the year have not yet been published.

CHROME MINES OF SOUTH AFRICA.—Production and sales were again restricted by the limited number of trucks made available by South African Railways and the net profit for the year ended June 30, 1954, after making provision for taxation and depreciation, amounted to £117,299. Since the close of the Company's financial year the rapid stockpiling of the excess of output over railings has necessitated a further curtailment of production and retrenchment of employees.

The Corporation is also interested *inter alia* in the following Company :—

TSUMEB CORPORATION.—The net profit for the year ended June 30, 1954, was £2,455,631 compared with £3,186,522 for the previous year and dividends totalling 10s. 6d. per share were declared. During the first nine months of the current financial year dividends totalling 12s. per share have been declared.

OTHER INTERESTS

BAY HALL TRUST.—The net profit for 1954 was £103,825. A dividend of 15 per cent less tax (against 13.64 per cent last year) was declared. The Trust's investments as at December 31 last showed an appreciation of £922,042 over book cost of £2,470,018.

BRITISH ENKA.—The recovery in the textile trade which began in September, 1952, continued through 1953 and the Company was able to return to full production and to sell its entire output. The net profit for the year to December 31, 1953, was £350,660, compared with a loss of £117,994 in the previous year ; £100,000 was appropriated to General Reserve ; a dividend of 10 per cent was paid and the carry-forward was increased from £26,976 to £184,119. The results of operations for 1954 have not yet been published.

SOUTH AFRICAN PULP AND PAPER INDUSTRIES.—Production at the Tugela Mill began in July, 1954, and by the end of the year a considerable tonnage of material of satisfactory quality, mainly for the corrugated packaging industry, had been produced.

The net profit from operations at both the Enstra and Tugela Mills for the year ended December 31, 1954, was £324,557 as compared with £334,947 for the previous year. The Company paid an interim dividend of 1s. per share.

Since the end of the year the Company has experienced difficult trading conditions. Whilst these commercial difficulties are believed to be only temporary, in order not to weaken its cash position the Company did not declare a final dividend for the year.

EXPLORATION

Drilling operations by Capital Mining Areas, Limited, during the year under review have indicated that the area underlain by payable Kimberley Reef is larger than visualized in last year's Annual Report. Drilling operations are still in progress, but it is anticipated that during the current year the Company may be in a position to apply to the Government for a Mining Lease over part of the area. The Company has exercised certain of its options to purchase mineral rights.

Some values in the Kimberley Reef, sufficiently encouraging to warrant further work, have been obtained in boreholes drilled by one of the Corporation's subsidiary exploratory companies operating adjacent to Capital Mining Areas. None of the other subsidiary companies in the Bethal and adjoining districts has so far encountered anything of economic interest, though further drilling remains to be done. Options over large areas have been abandoned.

Copies of the full Report and Accounts can be obtained on application at the London Office, Princes House, 95 Gresham Street, E.C.2.

AMALGAMATED COLLIERIES OF SOUTH AFRICA, LIMITED

(Incorporated in the Union of South Africa)

MR. T. COULTER'S STATEMENT

The annual report for the year ended December 31, 1954, and the statement by the chairman, **Mr. T. Coulter,** have been circulated to shareholders.

The following are extracts from the Chairman's statement:

COAL MINING OPERATIONS

Coal mining operations are conducted firstly through the medium of the Company's own collieries, Cornelia, near Vereeniging, and Schoongezicht, in the Middleburg district, and secondly, through the wholly owned subsidiary, Springfield Collieries Limited, near Balfour. The colliery of the subsidiary company Largo Colliery Company Limited, reached the end of its economic life in November, 1953, and that company will be liquidated as soon as is convenient.

In addition the Company has considerable interests in New Largo Colliery Limited and in Blesbok Colliery Limited, both producing collieries, and in Witbank Coal Holdings Limited, a company formed some years ago to hold coal-bearing properties in the Witbank district.

ACCOUNTS

The net profit for the year under review was £736,880, an increase of approximately £37,000 over the previous year's figure, due in the main to larger profits earned by Cornelia Colliery.

An amount of £131,506 was set aside as a provision for taxation and £500,500 was paid out in dividends, thereby maintaining the dividend rate at 3s. 6d. per share.

Fixed assets at December 31, 1954, totalled £5,723,220. Current assets of £1,053,864 exceeded current liabilities and provisions by £312,806. Current assets, however, included stores to the value of £167,664, so that the liquid surplus was of the order of £145,000, which should be regarded as being reserved for following up the investments of the Company or other contingencies.

At the year end the Company had drawn on Loan Account £650,000 from The Vereeniging Estates Limited, being the maximum amount in terms of the arrangements with the holding company. This loan bears interest at the rate of 5% per annum and is repayable on or before January 1, 1958.

It is evident that the bulk of this temporary borrowing forms part of the permanent capital of the Company and your Board is considering ways and means of dealing with it.

COLLIERIES

Cornelia Colliery: The sales output in 1954 was 3,710,414 tons and the mining profit £406,765, as against 3,473,534 tons and £356,328 in 1953.

Schoongezicht Colliery: This colliery produces a good quality coal for industrial and railway requirements. The sales output in 1954 was 840,564 tons and the mining profit £132,183, as against 846,441 tons and £161,645 in 1953.

Springfield Collieries Limited: The sales output for 1954 was 2,352,281 tons and the profit £232,325, as against 2,559,771 tons and £249,909 in 1953.

New Largo Colliery Limited: This company established its colliery on ground in the Balmoral/Kendal coalfield principally in order to meet the demands of the Rand Power Stations and the new Wilge Power Station which is being erected on the Company's leasehold property as a pithead station.

The sales output of the colliery in 1954 was 1,003,232 tons and the profit £144,737, as against 568,460 tons and £91,295 in 1953. Dividends totalling 6¼d. per 5s. share were declared in 1954.

Blesbok Colliery Limited: The sales output during 1954 was 529,724 tons and the profit £116,304, as against 619,302 tons and £142,733 in 1953. Dividends totalling 6d. per 5s. share were declared in 1954.

GENERAL

During the year 1954 the collieries of the Union of South Africa produced 32,314,000 tons of coal, as against 31,371,000 tons in 1953. Railway transport difficulties continue to hamper the coal industry and loss of working hours is assuming distressing proportions. Consumers have been forced to make increasing use of private road transport. During 1954 some 750,000 tons of coal were transported from pitheads by motor lorries.

It has been an inevitable consequence of the transport crisis that export business has been reduced to negligible quantities, little more than the minimum required for ship bunkering being sold in this market.

Copies of the report and accounts, which incorporate the full Statement by the Chairman, are obtainable from the London office of the company, 11 Old Jewry, E.C.2.

GRADUATE MINING ENGINEER required for Mining Company, Egypt; responsible underground experience essential directing/controlling mechanized operations, drilling, blasting, etc.; age 30; minimum salary £E1,200/1,800 according age, experience. Free married accommodation. Two years' contract. First class passages. Write Box M.J. 275, c/o 191 Gresham House, E.C.2.

ASSAYER required for Group of Gold Mines operating Gold Coast. Should have some wet assay and laboratory experience. Salary dependent on qualifications but net less than £1,000 p.a. Free furnished accommodation and medical services provided. Wives' home allowance or return fare to Gold Coast paid. 15 months' tour with 3 months' leave on full pay. Applications to Box 891, Walter Skinner Ltd., 20 Copthall Avenue, London, E.C.2.

SHIFT BOSSES REQUIRED at a salary equivalent to £1,026 per annum for British Gold Mine in South America producing 30,000 tons per month. Free furnished house and passages for wife and children, three year contract, good climate, other advantages. Applicants should be 25 to 30 years of age and be experienced miners having held positions of responsibility under similar circumstances. Reply to Box No. T158/5, Foster Turner and Everetts, Ltd., 11 Old Jewry, London, E.C.2.

HER MAJESTY'S OVERSEA CIVIL SERVICE

Vacancies exist in the Research Division of the Mines Department, Federation of Malaya, for 2 Research Officers (BCD 99/23/01).

Qualifications:

(a) Graduate in Mining Engineering, with experience of prospecting and mining techniques, including diamond drilling methods.

(b) Graduate in Mining, Metallurgy, or Chemical Engineering, preferably with honours degree and/or post-graduate research experience.

Duties:

(a) Investigations involving prospecting by methods other than geophysical, and research into mining methods.

(b) Research into mining and mineral dressing problems and application of results, through pilot stages, to utilization in the field.

The work will be carried out in the Research laboratories of the Department and in the field.

Terms of Appointment:

(a) and (b) Pensionable with consolidated salary in the scale £1,005-£2,044 per annum (according to experience).

In each case variable temporary allowances according to family commitments are payable.

Applications should be made in writing to the Director of Recruitment (Oversea Service), Colonial Office, Sanctuary Buildings, Great Smith Street, Westminster, S.W.1 (from whom further particulars can be obtained), quoting appropriate reference number and brief particulars of age, qualifications and experience.

THE VEREENIGING ESTATES, LIMITED

(Incorporated in the Union of South Africa)

IMPROVED PROFITS

The Annual Report for the year ended December 31, 1954, and the statement by the chairman, **Mr. T. Coulter,** have been circulated to shareholders. The following are extracts from the chairman's statement:

ACCOUNTS

Gross revenue for the year amounted to £1,020,494, as compared with £1,006,046 for the previous year. Expenses, including Directors' Fees, Salaries and provision for Depreciation, amounted to £40,168, leaving a profit of £980,326, which was a net improvement of £10,483. To the profit was added the sum of £217,356 unappropriated profit carried forward from the previous year, giving a total sum of £1,197,682 to be dealt with. Provision for taxation was £34,503, and £100,000 was transferred to General Reserve Account. An interim Dividend of 10 per cent was paid, and provision made for a Final Dividend of 20 per cent declared in February of this year, making a total distribution of 30 per cent, which absorbed £825,000. The balance of unappropriated profit carried forward to the current year was £238,179.

Share investments in subsidiary companies remained unchanged at £7,147,687. The market value at the end of the year totalled £12,947,337, an increase of £1,625,694 compared with the value at December 31, 1953.

Particulars are given in the Report of the Directors of the increase in investments in other companies. The market value of these investments is below book cost by an amount of £45,900 (previous year £159,328), but in view of the strong financial position of the Company no special reserve has been considered necessary in this connection.

Current assets amount to £1,306,681, and exceed current liabilities by £699,987.

The results quoted above are in respect of the Company's own accounts before consolidation.

COLLIERY INTERESTS

Operations of the subsidiary colliery companies were again adversely affected by the inadequate supply of railway trucks. Private road transport of coal is being organized on an ever increasing scale, and were it not for this, the position of domestic and certain industrial consumers would be even more serious.

The Railway Administration continues to make strenuous efforts to close the gap between its present capacity and the transport needs of the country, and many new works are in progress. The coal mining industry is co-operating to the fullest extent.

Whilst this shortage of railway transport exists, the Industry has been obliged to concentrate on the priority needs of the inland market with the result that only a relatively small tonnage of Transvaal coal was railed during the past year to Lourenco Marques for bunker and export purposes.

Amalgamated Collieries of South Africa Limited. The total output sold was 6,903,259 tons, a decrease of 505,980 tons compared with the previous year. This is due entirely to the fact that the previous year's total included the output of the subsidiary Largo Colliery Company Limited, which ceased production in November of that year, when the trade was transferred to New Largo Colliery. During the year under review New Largo Colliery Limited produced 1,003,232 sales tons, an increase of 434,772 tons compared with the previous year.

Amalgamated Collieries of South Africa Limited also holds a substantial interest in Blesbok Colliery Limited. The sales output at this colliery fell by 89,578 tons to 529,724 tons for the year, due to the truck supply position.

Dividends declared by Amalgamated Collieries of South Africa for the year were unchanged at 17½ per cent.

The Coronation Collieries Limited. The sales output of this company from its Kromdraai Colliery in the Witbank district was 1,050,490 tons, a decrease of 17,865 tons compared with the previous year. Its subsidiary, Vryheid Coronation Limited, produced 508,270 tons of coal, all of which was used for the manufacture of coke. Coke production amounted to 425,751 tons, being a decrease of 7,240 tons compared with the previous year.

There remained about 45,500 tons of coke in stock at Vryheid Coronation at December 31, 1954, which could not be delivered to consumers owing to shortage of railway transport. It is hoped that much of the stock will be cleared during the current year.

The distribution by the Coronation Collieries Limited of 35 per cent for the year, was unchanged.

Springbok Colliery Limited. The sales output of this subsidiary was 831,384 tons, a reduction of 25,557 tons compared with the previous year. The dividend declaration for the year was 32½ per cent, which was unchanged.

South African Coal Estates (Witbank) Limited. Your Company has a substantial interest in this company which produced 1,636,579 sales tons during the year as compared with 1,670,904 tons for the previous year. Dividend distributions received from this company during the year under review amounted to 18¾ per cent, a reduction of 1½ per cent compared with 1953. This Company will have to consider the establishment of a new pit in approximately 8 years time, and its Board of Directors have decided to effect a slight reduction in the annual dividend in order to accumulate funds for the financing of the new venture.

VEREENIGING BRICK AND TILE COMPANY LIMITED

This subsidiary company had a successful year, earning a net distributable profit, after taxation, of £334,221, which was £25,105 higher than that earned in 1953. The distribution to ordinary shareholders amounted to 20 per cent, which was unchanged.

Copies of the Annual Report and Accounts which incorporate the full Statement by the Chairman can be obtained from the London office of the Company, 11 Old Jewry, E.C.2.

RAND MINES, LIMITED

(Incorporated in the Union of South Africa)

SUMMARISED BALANCE SHEET, 31st DECEMBER, 1954

CAPITAL AND RESERVES

	£
Share Capital—Authorized 2,200,000 Shares of 5s. each, £550,000 Less 49,005 Shares of 5s. each held in Reserve, £12,251	
Issued—2,150,995 Shares of 5s. each	537,749
Revenue Reserves—For Investments £6,331,475; for Exploration £311,041; for Retiring Gratuities £100,000; Profit and Loss Account—Balance at December 31, 1954, £1,882,777	8,625,293
	£9,163,042

PROPERTY AND NET ASSETS

	£
Investments—	
Quoted Shares, Debentures, etc., at Cost or Stock Exchange valuation, whichever is the lower (Market Value—£11,225,401)	6,291,246
Unquoted Shares and Debentures at Cost or Directors' valuation whichever is the lower	281,738
	6,572,984
Government, Municipal and Public Utility Stocks and Debentures to secure Corner House Pension Fund Deposit £1,022,023. Less **Deposit by Trustees of Pension Fund** £982,500	39,523
	6,612,507
Fixed Assets—	
Trade Investments at Cost	1,159
Freehold Properties, etc.	25,993
Furniture, Plant, Vehicles, etc.	37,269
Subsidiary Companies—	
Shareholdings £71,527; **Loans** £27,700	99,227
Current Assets—	
Stores £16,176; **Debtors, Loans and Payments in Advance** £298,867; **Dividends Receivable** £310,925; **Cash Deposits, Fixed and on Call** £2,254,234; **Cash at Bankers and in Hand** £39,202—£2,919,404 *Deduct* **Liabilities and Provisions: Creditors** £115,788; **Shareholders—Dividends** £366,319; **Subsidiary Companies—Current Accounts** £835; **Provision for Claims in Respect of Forfeited Dividends** £49,575—£532,517	2,386,887
	£9,163,042

EXTRACT FROM PROFIT AND LOSS ACCOUNT

	£
PROFIT BEFORE TAXATION	666,398
Taxation	12,000
PROFIT AFTER TAXATION	654,398
BALANCE OF PROFIT AND LOSS ACCOUNT at December 31, 1953	1,884,719
	2,539,117
Deduct: **Dividends**—Nos. 102 and 103 each of 3s. per share £645,299	
Amount placed to Exploration Reserve £11,041	656,340
BALANCE OF PROFIT AND LOSS ACCOUNT, at December 31, 1954, transferred to Balance Sheet	£1,882,777

The full Report and Accounts may be obtained from the London Secretaries, A. Moir & Co., 4 London Wall Buildings, London, E.C.2.

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CROWN MINES, LIMITED

(Incorporated in the Union of South Africa)

Extracted from the Annual Report for the Year ended December 31, 1954
Capital : £1,000,000 in 10s. Shares. £943,062 10s. issued, fully paid

Tons milled 3,460,000 **Gold recovered 548,319 f.oz.**

		Per ton milled
Working Revenue	£6,843,298	£1 19 7
Working Expenditure	6,236,823	1 16 1
Working Profit	£606,475	£0 3 6
Add Sundry Revenue less Expenses	95,100	
	701,575	
Taxation (£61,713) and Mineral Lease Consideration (£773)	62,486	
Profit after Taxation and Lease Consideration	639,089	
Balance of Income and Expenditure Account	1,110,107	£1,749,196
Expenditure on Mining Assets and Trade Investments	17,621	
Dividends declared—No. 106 of 3s. 0d. and 107 of 3s. 6d. per share	612,991	630,612
Balance of Income and Expenditure Account at December 31, 1954		£1,118,584

The ore reserve at December 31, 1954, was re-estimated as follows :—

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.
Main Reef	249	4.0	50.3	—	—	—	249	4.0	50.3
Main Reef Leader	6,246	4.2	48.3	3,732	6.1	47.4	9,978	4.9	48.0
South Reef	958	3.9	49.2	915	4.4	51.4	1,873	4.2	50.2
Total	7,453	4.2	48.5	4,647	5.8	48.1	12,100	4.8	48.4

Compared with the previous year the available reserve decreased by **115,000** tons, the value being **0.1** dwt. lower and the width unaltered.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4 London Wall Buildings, E.C.2.

CITY DEEP, LIMITED

(Incorporated in the Union of South Africa)

Extracted from the Annual Report for the Year ended December 31, 1954
Capital : £2,500,000 in £1 Shares. £2,026,832 issued, fully paid

Tons Milled 1,955,000 **Gold recovered 373,226 f.oz.**

		Per ton milled
Working Revenue	£4,657,582	£2 7 8
Working Expenditure	4,481,697	2 5 10
Working Profit	£175,885	£0 1 10
Add Sundry Revenue *less* Expenses	49,216	
	225,101	
Taxation	7,410	
Profit after Taxation	217,691	
Balance of Income and Expenditure Account	694,830	£912,521
Expenditure on Mining Assets and Trade Investments	93,460	
Dividends declared—Nos. 69 and 70 each of 6d. per share	101,342	194,802
Balance of Income and Expenditure Account at December 31, 1954		£717,719

The ore reserve was re-estimated at December 31, 1954, as follows :—

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.
Pyritic Quartzites	17	4.1	67.0	—	—	—	17	4.1	67.0
Main Reef	201	3.9	55.9	14	4.2	54.2	215	3.9	55.8
Main Reef Leader	3,356	6.3	40.6	666	6.0	44.6	4,022	6.3	41.2
South Reef	759	4.5	46.6	142	4.5	42.7	901	4.5	45.9
Total	4,333	5.9	42.1	822	5.7	44.4	5,155	5.9	42.5

Compared with the previous year the available reserve decreased by **547,000** tons, the value being **0.1** dwt. higher and the width **0.3** in. lower.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4 London Wall Buildings, E.C.2.

EAST RAND PROPRIETARY MINES, LIMITED

(Incorporated in the Union of South Africa)

Extracted from the Annual Report for the Year ended December 31, 1954
Capital : £2,000,000 in 10s. Shares. £1,980,000 issued, fully paid

Tons milled 2,475,000 **Gold recovered 560,469 f.oz.**

		Per ton milled
Working Revenue	£6,995,967	£2 16 7
Working Expenditure	5,473,686	2 4 3
Working Profit	1,522,281	£0 12 4
Add Sundry Revenue *less* Expenses	53,852	
	1,576,133	
Taxation	397,160	
Profit after taxation	1,178,973	
Balance of Income and Expenditure Account	928,783	£2,107,756
Expenditure on Mining Assets and Trade Investments	535,288	
Dividends declared—Nos. 69 and 70 each of 1s. 9d. per share	693,000	1,228,288
Balance of Income and Expenditure Account at December 31, 1954		£879,468

The ore reserve was re-estimated as at December 31, 1954, as follows:-

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.
Main Reef	839	4.2	53.5	585	3.8	61.3	1,424	4.0	56.5
Main Reef Leader	443	4.5	45.2	596	4.9	48.0	1,039	4.7	46.8
Composite Reef	3,573	6.6	44.3	895	4.6	57.1	4,468	6.2	46.3
South Reef	569	3.8	48.3	141	4.7	51.6	710	4.0	48.9
Total	5,424	5.7	46.0	2,217	4.5	54.9	7,641	5.4	48.2

Compared with the previous year the available reserve decreased by **237,000** tons, the value being **0.1** dwt. higher and the width **0.2** in. less.

The full Report and Accounts may be obtained from the Secretaries of the European Committee, A. MOIR & CO., 4 London Wall Buildings, E.C.2.

DURBAN ROODEPOORT DEEP, LTD.

(Incorporated in the Union of South Africa)

Extracted from the Annual Report for the Year ended December 31, 1954
Capital : £1,200,000 in 10s. Shares. £1,162,500 issued, fully paid

Tons Milled 2,139,000 **Gold recovered 354,122 f.oz.**

		Per ton milled
Working Revenue	£4,422,241	£2 1 4
Working Expenditure	3,853,136	1 16 0
Working Profit	569,105	£0 5 4
Add Sundry Revenue *less* expenses	34,527	
	603,632	
Taxation	42,423	
Profit after Taxation	561,209	
Balance of Income and Expenditure Account	644,082	£1,205,291
Expenditure on Mining Assets and Trade Investments	169,465	
Dividends declared—Nos. 67 and 68 each of 1s. 6d. per share	348,750	518,215
Balance of Income and Expenditure Account at December 31, 1954		£687,076

The ore reserve was re-estimated as at December 31, 1954, as follows:-

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.
Main Reef	5,774	4.5	62.8	622	4.1	68.0	6,396	4.5	63.2
Main Reef Leader	36	5.0	37.6	22	3.5	40.5	58	4.4	38.6
South Reef	659	3.9	41.9	34	3.2	40.8	693	3.8	41.8
Kimberley Reef	1,944	3.5	62.7	—	—	—	1,944	3.5	62.7
Total	8,413	4.2	60.2	678	4.0	64.4	9,091	4.2	60.5

Compared with the previous year, the available reserve improved by **670,000** tons despite a loss of **217,000** tons due to the revised pay limits dictated by increased working costs.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4 London Wall Buildings, E.C.2.

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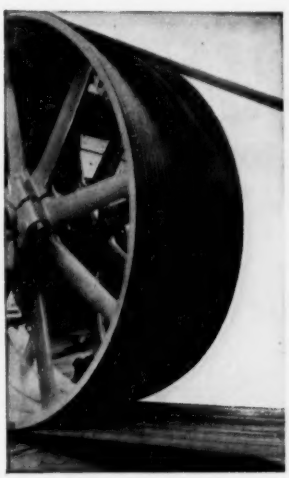

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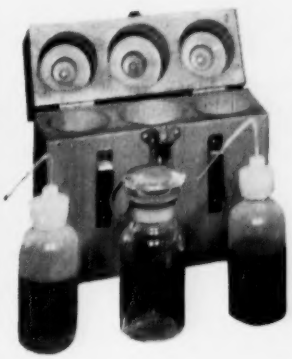

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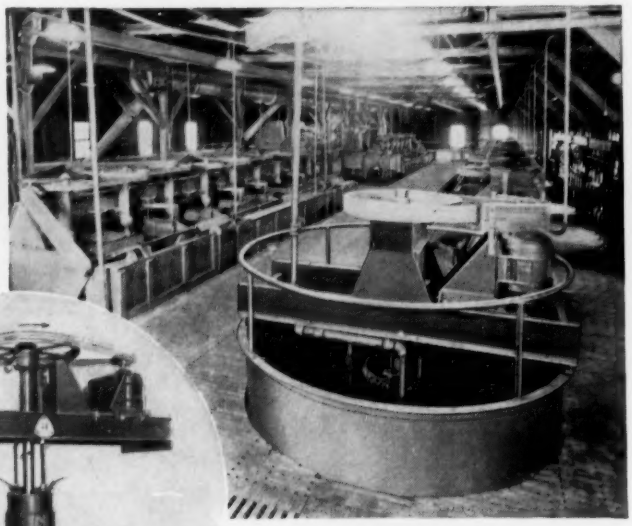

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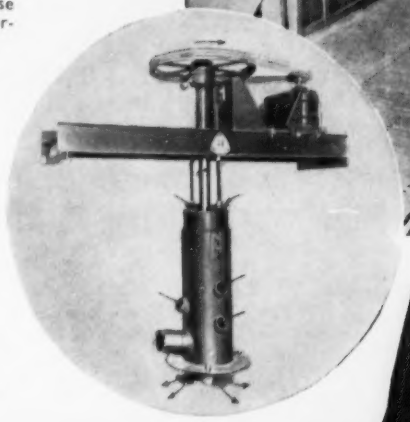

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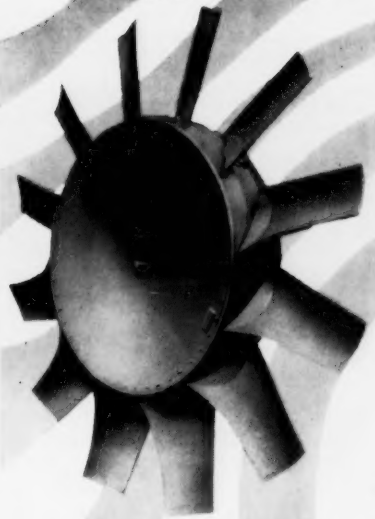

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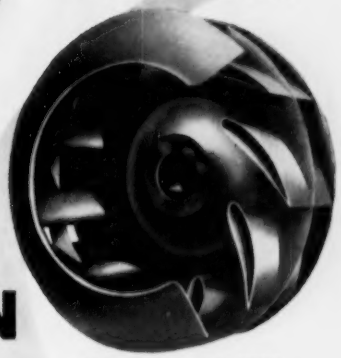

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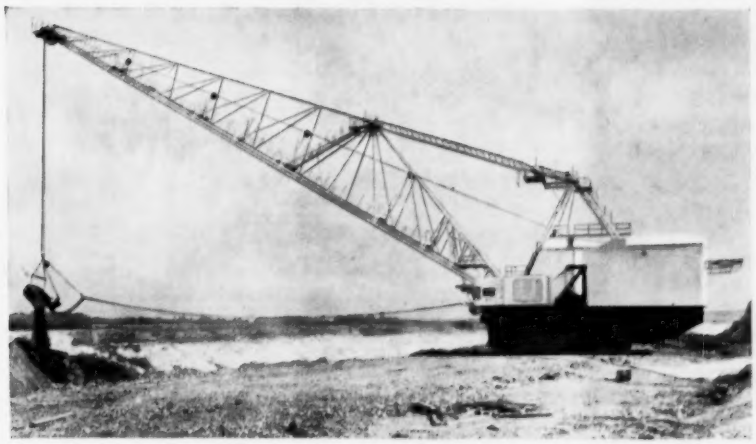

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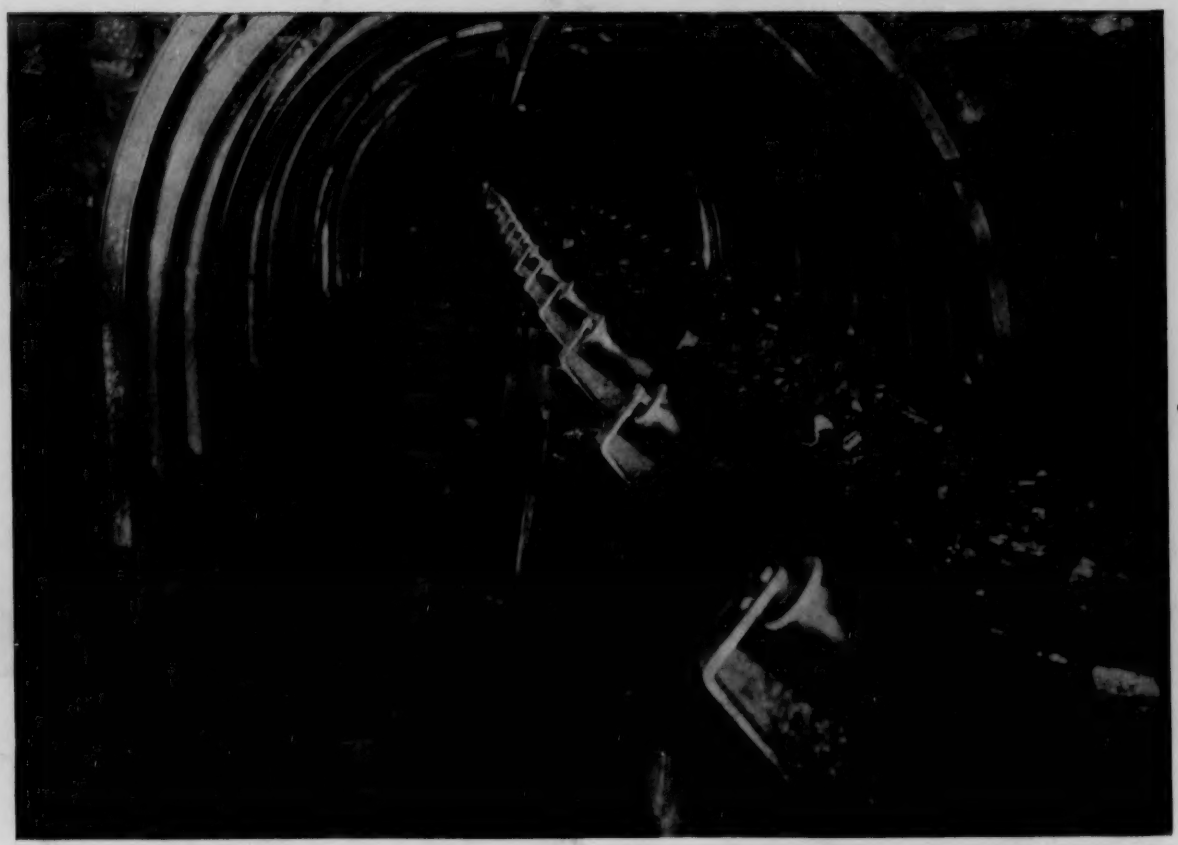

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